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ABSTRACT

This guide for motorcycle safety instructors is intended to provide essential information in a usable format for teaching the basic knowledge and skills to (1) maintain the motorcycle in a safe riding condition: (2) develop an ability to handle the motorcycle in a safe and sane manner: (3) develop defensive driving techniques: and (4) understand the legal and moral responsibilities assumed by the operator. After presenting an overview of the organization and administration of the guide, nine instructional units are outlined. The first four units cover classroom instruction on the following topics: an introduction to motorcycle safety education: knowing the motorcycle: riding the motorcycle: and buying and insuring the motorcycle. The last five units provide guidelines for teaching range operation. The range operation units include: an introduction to range operation: the first ride: basic motorcycle driving skills: routine riding situations: and a series of range exercises. (BM)

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ED189402

MOTORCYCLE SAFETY EDUCATION

STATE DEPARTMENT OF EDUCATION
MONTGOMERY, ALABAMA

LeRoy Brown
State Superintendent of Education

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Bulletin No. 21

AUG 7 1980

FOREWORD

The State Department of Education is acutely aware of the tremendous growth in the use of motorcycles on the streets and highways of Alabama. Each of us must recognize the fact that the motorcycle is a part of the daily traffic scene and we must learn to grant the motorcycle rider the same respect that we do any other driver. By the same token, the motorcycle rider must submit to all rules, laws, and regulations by which other drivers abide.

The school has the important responsibility of providing educational experiences that will build sound attitudes, develop skills, and impart knowledge which will make life safer for our school children.

In keeping with this department's commitment to a comprehensive program of traffic safety education for grades K-12, the State Department of Education presents this guide to aid teachers who are or soon will be teaching this important course.

LeRoy Brown
State Superintendent of Education

INTRODUCTION

Each day as our traffic scene becomes more and more complex we are made increasingly aware of the need for traffic safety education in our public schools. We are also aware that because of economical and recreational changes there is an ever-increasing number of motorcycles in this complex traffic scene.

The State Department of Education is aware of the responsibility that our schools have to provide safety education instruction for our young people, and this guide for motorcycle safety education is a part of the K-12 program to which we are committed.

The guide contains an administrative section that should be carefully read by the administrators of local school systems. Also, it contains a section for classroom instruction and on-the-cycle instruction.

It is our hope that through the use of this guide and the further development of the motorcycle safety education program, our young people can become more effective and safer motorcycle riders.

J. C. Blair, Director
Division of Instruction

ACKNOWLEDGEMENTS

I would like to take this opportunity to express my appreciation to the people who worked long and diligently toward the completion of this guide.

We are proud of the fact that Alabama teachers contributed a major portion of the work of this guide. Their enthusiasm and untiring efforts led to the swift completion of this publication. The members of this committee are as follow:

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Special appreciation is given to the Governor's Office of Highway and Traffic Safety under which this guide was financed.

Appreciation is further extended to Mrs. Eula Milner of the State Department of Education for the many hours spent in compiling the guide.

Kennith S. Blankenship, Coordinator
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State Department of Education

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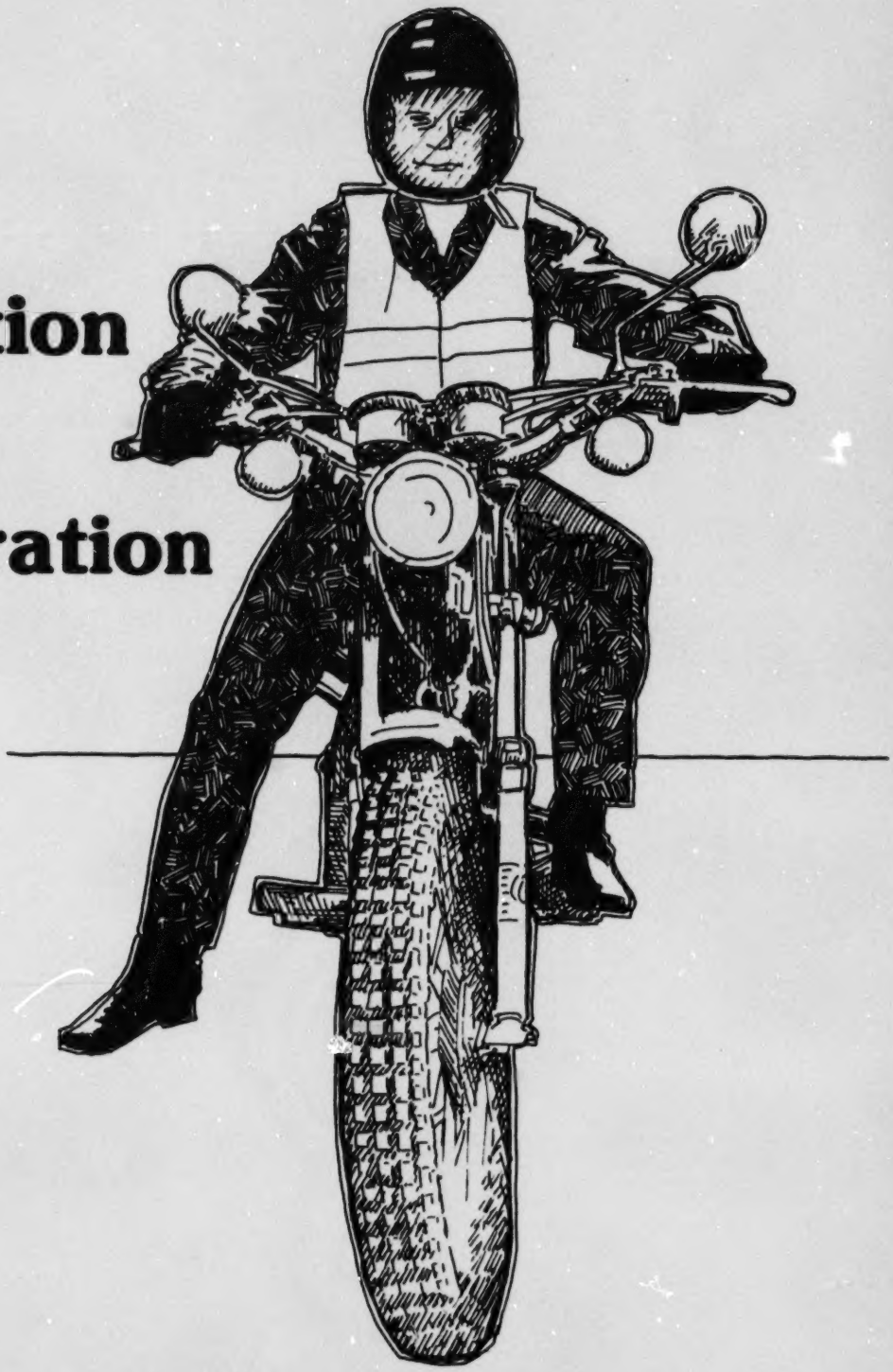
Organization And Administration



Organization and Administration

I. Program Responsibility

A. The State Department of Education is to supervise and direct the comprehensive motorcycle and traffic safety programs in the school systems.

B. The chief administrative officer of the State Department of Education is the State Superintendent of Education. It is his duty to administer this state plan as the administrative officer.

II. Minimum Standards for Motorcycle Safety Education Instructors

Motorcycle Education Instructor Qualifications

1. Each instructor shall have at least a Rank II Alabama Teacher Certificate valid for teaching in Alabama schools.
2. Each school system shall establish policies which will insure that the instructor has no physical qualities that would endanger students or other highway users.
3. Each instructor will have a valid Alabama driver's license.
4. Each instructor must possess a safe driving record free from repeated convictions of major traffic law violations.
5. Each instructor will be certified in driver education or physical education, and in addition will have satisfactorily completed an approved motorcycle safety education course. Beginning with the school year 1976-77 the motorcycle safety education instructor will be required to have completed an approved advanced course in motorcycle safety education.
6. The motorcycle safety education instructor must be a full-time employee of the school system in which he is teaching.
7. Each instructor must have his application approved by the State Superintendent of Education.

III. Motorcycle Safety Education Program Requirements

A. Course Requirements

1. A course will consist of a minimum of twenty clock hours.
2. On-cycle work will be confined to off-street driving areas.
3. A flat hard surface of approximately 100 by 200 feet is recommended, but dimensions may vary in accordance with the area available.
4. Traffic cones or stanchions are required in proper numbers to outline the various driving exercises.
5. Driving exercise area will be marked with lime or other suitable marking substances.
6. Other instructional aids helpful in operating the program will include but not be limited to the following:
   a. Instructor aids
      1) Clipboard
      2) Rating sheets
      3) Lesson plans
   b. Communication equipment
      1) Loudspeaker
      2) Whistle
   c. Maintenance equipment
      1) Motorcycle repair kit
      2) Screwdrivers, pliers, etc.
      3) Cleaning equipment
      4) Extra spark plugs
7. Class size will range from 12 to 20 students.
8. An approved D.O.T. helmet will be obtained for each motorcycle in the program. Plastic headliners (such as a ladies folding rain cap) will be used to cover hair when students share the same helmet.
9. The instructor will insist upon the strict observance of safe driving procedures during on-cycle instruction periods.

B. Student Requirements

1. A motorcycle permit or license is a prerequisite for the motorcycle safety education course. This license or permit must be obtained before enrollment in the class.
2. Enrollees must carry school insurance covering school-time activities or show proof of private medical insurance plan.
3. Students will furnish long sleeve jacket, long pants, gloves, and ankle-protecting shoes. These items will be made of leather or some other heavy material.

IV. Obtaining, Equipping, and Using Motorcycles

A. Obtaining Motorcycles

1. Motorcycles may be obtained on a loan, rental, or purchase basis. When motorcycles are obtained by loan or rental from a motorcycle dealer, it is important that all local dealers be given the opportunity to participate.
2. Schools incorporating motorcycle safety education into their programs will conform to

the suggestions and recommendations presented in this guide. The motorcycle dealers of the area will be presented with copies of the proposed program.

3. Details such as the frequency with which motorcycles should be replaced, necessary operating and maintenance cost, and storage will be worked out before the cycles are obtained.
4. If a school system plans to use a motorcycle on a loan or rental basis, an agreement in which the conditions of the loan or rental are clearly set forth will be drawn up and signed by school authorities and the lending or renting agency.
5. School authorities will set up and rigidly follow a definite plan for periodic motorcycle inspection, maintenance, and repairs in accordance with the recommendations of motorcycle manufacturers.

B. Use and Misuse of Instructional Motorcycles

1. The school system should have a clearly stated policy governing the circumstances, times, and persons concerned with the use of motorcycles in motorcycle safety education programs and should provide means for assuring adherence to the policy. School authorities should exercise extreme care to prevent such motorcycles from being used in unusual places at unusual times or by unauthorized persons. Motorcycles on loan from dealers for use in motorcycle safety education instruction will not be used for any other purpose. Misuse of safety education motorcycles can lead to distrust on the part of the dealers, causing them to discontinue this valuable service.
2. Proper care is necessary as the dealer likes to get the motorcycle back in the best condition possible. School authorities should properly recognize the services being rendered by motorcycle dealers cooperating in the program.
3. School systems including motorcycle safety education should keep adequate records of their use as a basis for improving instruction, measuring results, controlling costs, and protecting students and school personnel.

V. Insurance of Motorcycles in the Motorcycle Safety Education Program

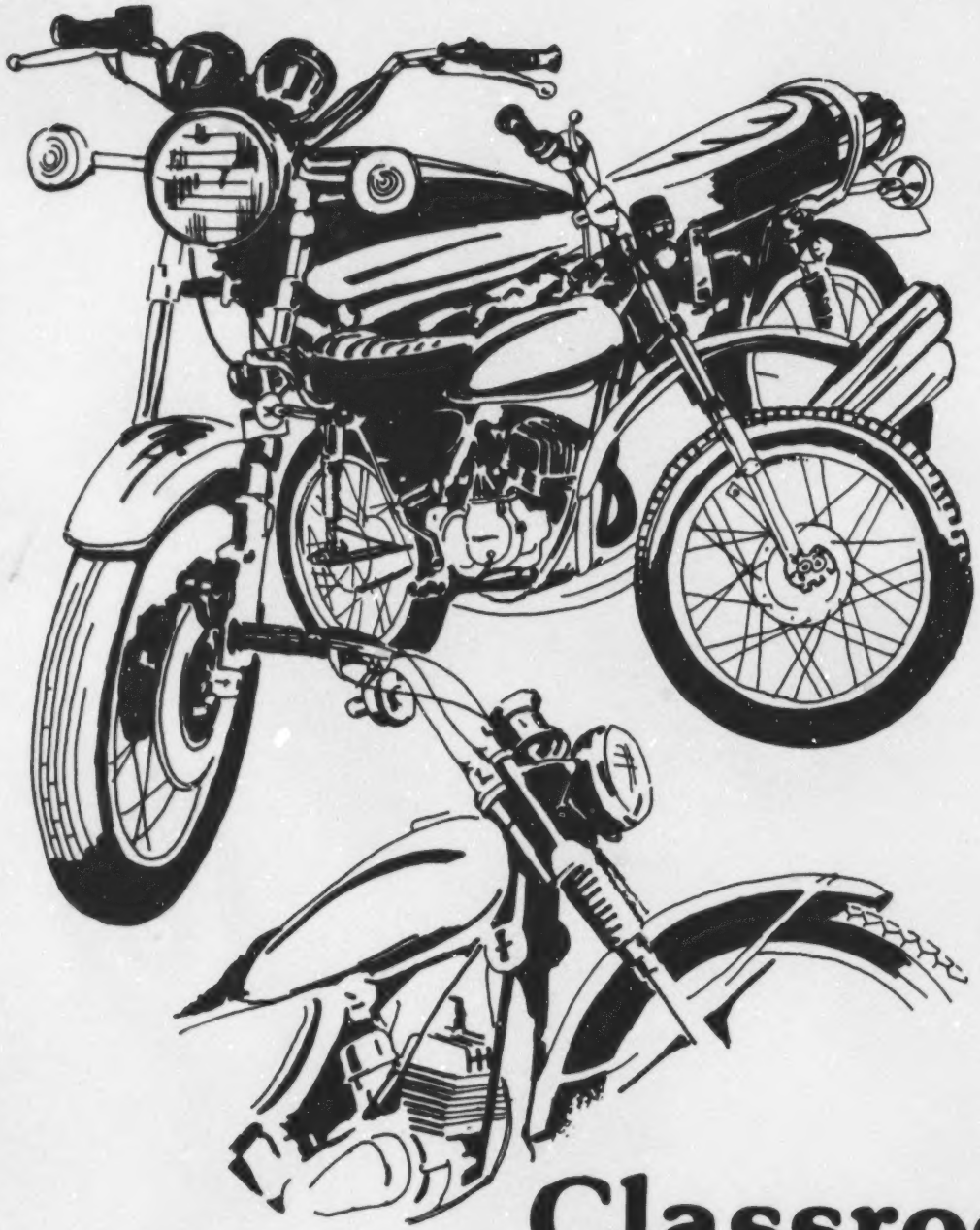
A. Adequate motorcycle insurance coverage should be provided for the protection of the school, the teacher, and the students who use the motorcycle.

B. If the motorcycle is borrowed or rented from a motorcycle dealer, coverage should also be provided for the protection of the dealer.

C. In most instances it is the obligation of the school to provide this insurance.

D. Minimum coverage should include $100,000-$300,000 public liability.

E. Limits of collision and comprehensive insurance (fire, theft, glass breakage, etc.) will be left to the discretion of the local school system.



Classroom Instruction

UNIT A
INTRODUCTION TO MOTORCYCLE SAFETY EDUCATION

I. Introduction

This guide is being offered to the motorcycle safety instructor not as a "hard and fast" rule but that it might prove to be an effective instrument in the preparation of his lesson plans. Its purpose from the start was never to be all inclusive but a conscientious effort to assemble within a single volume essential information in a usable format.

This motorcycle safety education guide has been written with the knowledge that it is an absolute necessity that the novice rider be provided with the minimal basic knowledge essential for survival within today's increasingly complex traffic environment.

Therefore, we must provide the basic knowledge and skills essential to

1. maintain the motorcycle in a safe riding condition
   a. through a knowledge of the vehicle, and
   b. by means of systematic inspections and checks.
2. develop the ability to handle the motorcycle in a safe and sane manner
   a. by use of drills and practices,
   b. other supervised ranges, activities, and
   c. by means of simulation.
3. develop defensive driving techniques
   a. utilizing the "Smith System,"
   b. increasing perceptual skills,
   c. understanding the "rules of the road" and pertinent traffic laws, rules, and regulations, and
   d. recognizing standard road signs, signals, and markings.
4. understand the legal and moral responsibilities assumed by the operator.

II. A Background Survey

Participation in motorcycling as a whole has been on the increase since the end of World War II when an interest in it was retained by returning servicemen and, except for a hiatus in the 1950's brought about by the activities of such far-out groups as the proverbial "Hell's Angels," it has deservedly maintained its reputation as a clean-cut recreational vehicle albeit a hazardous one. Basically the motorcycle is exactly this, a hazardous means of transportation. While this state cannot be entirely eliminated, it can be mitigated by a knowledge of motorcycle safety.

It is inevitable that within the next several years, because of the increasing problems of traffic congestion, limited expansion of road facilities, and the energy crisis, an alternative form of individualized transportation will be developed. To date the motorcycle seems to offer the most practical alternative.

Partly due to the lack of organized on-the-cycle instruction courses, many of the beginning motorcycle operators are unprepared and too inexperienced to cope with the problems confronting them when they operate motorcycles upon our streets and roads. There is a need to aid the novice motorcyclist in becoming a safer, more efficient user of our transportation system. This is an area in which our middle and junior high schools can become involved.

Motorcycles can be dangerous in the hands of inexperienced and immature operators. The increase of users has brought about an increasing number of accidents. About 20 percent of the persons involved in motorcycle crashes are riding for the first or second time.

Surveys by various interested agencies such as the National Safety Council reveal that 70 percent of all motorcycle fatalities occur within the first six months of riding or using a strange motorcycle. Furthermore, coincidentally, a similar percentage of all automobile-motorcycle conflicts within the traffic mix are directly chargeable to the automobile. The reason is simply that few automobile drivers have been trained to cope with the motorcyclist on the road. Aside from being cognizant of limitations inherent to two-wheeled vehicles, there are also certain psychological factors working both directly and indirectly upon the automobile driver. This imposes, in fact makes it imperative, that the motorcyclist be not only overly familiar with his vehicle and its limitations, as well as a defensive operator.

Thus the critical period is the first six months. This is the period within which we hope to train our novice motorcyclists.

III. The Trend Across the Nation

The trend across the nation and in Alabama during

the last few years has led to a dramatic increase in the number of motorcycles on our highways and byways both as vehicles used in transportation and as recreational and sporting vehicles.

By 1973 there were more than 7,500,000 licensed and registered two-wheeled motor vehicles. It is anticipated that an additional 1,000,000 more will follow in 1974 with proportionate increases as the motorcycle becomes more and more a part of the transportational scene.

It is estimated that two and one-half persons will be riding each vehicle, an estimated cycling population of about 20,000,000 riders. In our own state, 1973 saw over 65,000 motorcycles licensed to be driven upon Alabama's highways and this total fails to include off-street vehicles which require no licensing.

It may be noted that the Japanese motorcycle industry, which supplies 80% of the vehicles on the road today, has now decided to concentrate on the production of motorcycles not as pleasure or recreational vehicles but as a basic means of transportation. This has been based upon a cold business appraisal of the future of motorcycling, and millions of dollars have been committed towards attaining this goal.

The present-day traffic mix presents the greatest single hazard to the motorcyclists and conversely the greatest single challenge to the rider because

1. the motorcycle is extremely dangerous and becomes even more so in the hands of an inexperienced or immature rider, and
2. the motorcycles are here to stay and will increasingly become a factor in tomorrow's traffic mix. Therefore, at this late date it does not seem feasible to re-educate the automobile driver to coexist with the motorcyclists within the traffic environment, but it becomes incumbent upon the educational system to provide such an educational experience.

We hope that in some small way we can help along the way.

UNIT B
KNOWING THE MOTORCYCLE

I. Identification of Components

Objective — Student must be able to identify and describe the function of the various components of the motorcycle.

Identification of components — a knowledge of each of the hundreds of parts essential in the construction of a motorcycle is not necessary for safe operation. However, there are several important components with which every cyclist should be familiar.

A. Frame

Several different types of frame construction are used in the manufacture of today's motorcycles.

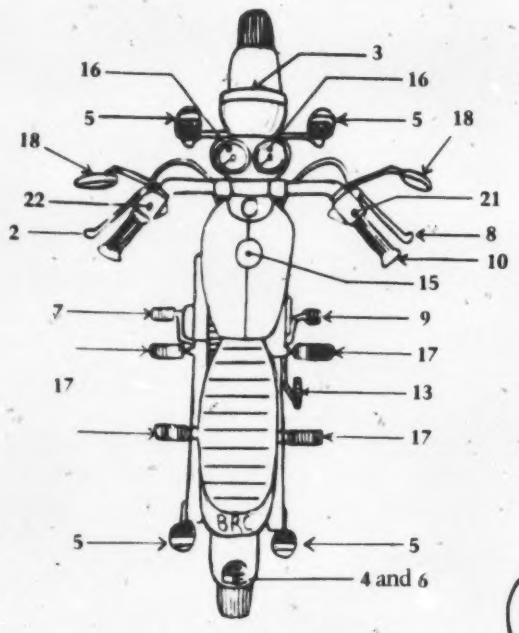
1. The tubular frame is the most popular type. These frames are easily repaired when damaged and have the added advantage of being light but strong.
2. Cradle or semi-cradle frame locates the engine at the bottom of a loop or "box" or tubing.
3. Spine frames utilize a "backbone" made up of a single large-diameter tube or welded box-section. Scooters usually use the spine frame construction.
4. Many two-wheelers will utilize a combination of the above-mentioned constructions.

B. Wheels

Wheel and tire requirements are determined by the size of the motorcycle and its individual use. The owner's manual of each motorcycle will be helpful in this area.

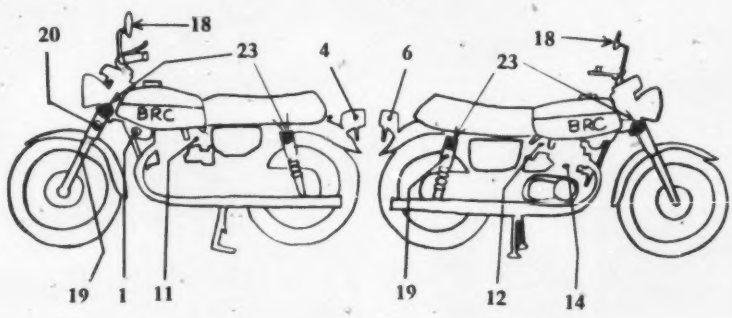
C. Steering Head

The steering head determines steering rigidity. Different adjustments will be necessary for the



You can use the following drawings as guides to identify the various controls, devices and related parts. They will be shown from a top view, right-side, and left-side view of the motorcycle.
The numbers indicate the following:

1. Ignition Switch
2. Clutch Lever
3. Headlight
4. Taillight
5. Turn Signal Light
6. Brake Lights
7. Gear Change Lever
8. Front Brake Lever
9. Rear Brake Pedal
10. Throttle
11. Choke
12. Fuel Supply Valve
13. Starter
14. Oil Filler Cap
15. Fuel Filler Cap
16. Speedometer and Tachometer
17. Foot Pegs
18. Mirror
19. Shock Absorbers
20. Fork Lock
21. Kill Switch
22. Horn
23. Side Reflectors



different types of driving; i.e., highway driving requires a stiff adjustment while around-town driving requires a looser adjustment.

D. **Front and Rear Suspension**

Front and rear suspension systems vary with the types and makes of motorcycles.

1. Front suspensions are usually of the hydraulically damped telescoping fork variety. Springing is usually accomplished by means of a coilspring encased within the fork mechanism.
2. Rear suspension systems utilize a swinging fork with a pivot point near the gearbox. This fork moves through the same arc as does the chain. Coilsprings and hydraulic dampers control fork travel and are adjustable for varying loads.

E. **Front and Rear Brakes**

While most motorcycles utilize the standard cable-operated drum-type brake, many of the late model high performance motorcycles are fitted with hydraulically activated disc brakes.

F. **Powerplants**

Motorcycle engines may be generally categorized into two distinct groups — the 4-stroke cycle and the 2-stroke cycle. Each type has distinct advantages and disadvantages in certain applications, but it is not necessary to examine the types in any great detail.

G. **Instrumentation, Lighting, Auxiliary Equipment**

Instrumentation, lighting, and other auxiliary equipment will vary greatly with different makes of motorcycles and with the use to which they will be put.

1. Instrumentation will include speedometer, odometer, tachometer, high-low beam indicator, neutral gear indicator light and ignition on-off indicator light.
2. Lighting will include high-low beam headlight, taillight and brake light, tag light, and front and rear turn indicators.
3. Auxiliary equipment is the most varied of all and may include fenders, right and left rearview mirrors, radio, high-rise handlebars, "sissy bar" (a raised frame-work behind the saddle), saddle bags, roll bars, passenger footpegs, wind screens and cowlings and other accessory items too numerous to mention.

II. Operating the Control Devices

Objective — The student should be able to operate the various control devices without instruction.

A. **Fuel Shut-off Valve**

This petcock is usually located under the gas tank and is turned to the *on* position to supply fuel to the engine. Since this is a gravity-feed system, the valve must always be put in the *off* position when the engine is shut down. Most cycles also utilize a *reserve* position as a low-fuel warning.

B. **Ignition Switch**

1. Just as with the automobile, the ignition switch is operated with a removable key, which must be moved to the *on* position before the engine can be started. All motorcycles utilize a "kickstart" mechanism, but many modern cycles have an electric starter as well.
2. The ignition switch may be located at the handlebars or below the fuel tank usually on the left-hand side of the cycle.
3. Many cycles will incorporate *park* and *light* positions. The key can be removed in the *off* and *park* positions. Both the *light* and the *on* positions will activate the ignition system.

C. **Throttle**

The throttle on a motorcycle is the equivalent of the accelerator or "gas pedal" on an automobile. This control is located on the right handlebar grip.

1. Engine speed is controlled by the throttle in that its operation increases or decreases the flow of fuel to the engine.
2. Gas flow is increased by twisting the throttle toward the driver. This will increase the speed of the engine.
3. Gas flow is decreased on shut-off by twisting the throttle away from the driver.
4. Most motorcycles will return to idling speed when the throttle is released.
5. While riding, the driver should keep a "knuckles up" grip on the throttle with the fingers wrapped around the handlebar grip.

D. **Clutch Lever**

The clutch lever on a motorcycle corresponds to the clutch pedal on a straight-shift automobile.

1. This lever is located at the left handlebar grip and is activated by squeezing the lever toward the grip. This disconnects power from the rear wheel.
2. Power is engaged by slowly releasing the clutch lever while gradually increasing the throttle opening.
3. The clutch lever is engaged and disengaged during gear shifts and in starting and stopping the motorcycle. The clutch must be disengaged *before shifting gears.*

E. **Neutral Indicator**

This green light is located in the instrument cluster at the center of the handlebars and flashes on when the transmission is in neutral position.

F. **Gear Shift Lever**

This lever is usually located on the left side of the

motorcycle and is operated by the toe of the left foot.

1. Gear change is effected by depressing or lifting the lever.
2. Most motorcycle transmissions incorporate four or five gear positions and a neutral position.
3. When the lever is in the neutral position, no power is transmitted to the rear wheel. The cycle engine is usually started with the lever in the neutral position.
4. Low or first gear is usually in the full down position and subsequent gears are selected by lifting the lever one position at each gear change.
5. Neutral position may be found between first and second gears on some cycles.

G. **Rear Brake**

The rear brake is pedal-operated with the pedal usually located near the right-hand footpeg.

1. Beginning cyclists should use this brake only in the initial stage of instruction since this insures more stable stopping conditions.
2. The brake pedal should be depressed gradually but firmly to prevent skidding and loss of control.
3. The rear brake pedal activates the brake light, which indicates to following traffic that the cycle is slowing or stopping.

H. **Front Brake**

The front brake is activated with a lever which is usually located at the right-hand grip.

1. The front brake is engaged by gradually but firmly squeezing the lever toward the hand grip.
2. This brake is engaged *after* the rear brake to insure stability and provides much more effective braking.
3. When the front brake is applied too hard, the front wheel may "tuck under" or lock, throwing the rider.
4. The front brake is more effective because of the weight-shift to the front when brakes are applied.

III. Other Control Devices and Instruments

A. **Headlight Switch**

The headlight switch may be found in the instrument cluster, right or left handlebar or on the ignition switch.

B. **Dimmer Switch and High-Beam Indicator**

The dimmer switch is located on the left or right handlebar. A high-beam indicator is located in the instrument cluster.

C. **Turn Signal Switch**

The turn signal switch is usually located on the left handlebar. *R* position flashes right-turn signals at front and rear of the cycle. *L* position flashes left-turn signals. This switch must be returned to central position manually after the turn is completed.

D. **Choke**

This device regulates the ratio of the fuel-to-air mixture to the engine. An increased ratio of fuel is required to start a cold engine. The choke must be returned to the *off* position after the engine is warm to prevent possible engine damage.

E. **Starter**

1. All motorcycles are provided with some type of "kick starter." This is a fold-out pedal located behind one of the footpegs. The kick starter is activated by a quick downward shove to the bottom of the pedal stroke.
2. Electric start systems are similar to those found on older automobiles. After the ignition switch is moved to the *on* position, the starter switch is depressed to start the engine.
3. The transmission must be placed in the neutral position with either of these starting methods.

F. **Speedometer-Odometer**

As with the automobile, the speedometer indicates the rate of speed and the odometer indicates the number of miles travelled.

G. **Tachometer**

This instrument indicates how fast the engine is running in revolutions per minute. All tachometers are "red lined" and RPM must not exceed this figure lest severe internal damage be incurred to the engine.

H. **Fuel Filler Cap**

On a motorcycle the fuel level is checked by simply removing the filler cap and visually checking.

I. **Oil Filler Cap and Level Indicator**

Oil level is checked by a dip stick attached to the oil filler cap or through a glass window built into the oil tank. This level is extremely critical and *must not* be ignored.

J. **Battery**

The battery is similar to an automobile battery and supplies electrical power for starting, ignition, and lighting.

K. **Tool Kit**

A fairly complete tool kit is usually provided with new motorcycles. Tools are provided to perform most routine maintenance tasks.

L. **Rider Footpegs**

Rider footpegs are provided on motorcycles that have a passenger seat. A passenger should not be ridden on a motorcycle without these pegs.

M. **Fork Lock**

This is a key-operated theft-preventive device located on the front fork of the motorcycle. The ignition key usually operates this lock. The front wheel is turned to one side and locked in that position.

N. **Mirrors**

Rearview mirrors on both handlebars are recommended. They give a view of traffic approaching from the rear and sides.

O. **Kick Stand**

This is a parking device attached to the frame of the motorcycle. It may either swing out from the side or swing downward, lifting the front wheel.

P. **Power Chain**

This heavy duty chain delivers power to the rear driving wheel, and it must be kept in proper adjustment and lubricated and clean at all times.

IV. Maintenance, Care, and Adjustments

Objective — The student should be able to make routine adjustments and perform daily and periodic maintenance checks.

A. Daily Maintenance Checks

The following steps may be included in a "prestart" routine:

1. **Horn, Lights, and Indicator Lights**

The operation of these may be checked by turning the ignition on and operating the various controls (horn button, light switch, high-low beam switch, brake pedal, gear selector, etc.).

2. **Tires and Wheels**

Check for cuts and gouges in tires; check inflation levels with an air pressure gauge. Tread depth must exceed $^1/_{16}$". Wheel spokes may be checked for tightness by rapping a pencil or screwdriver across the spokes. A rattling sound or varying pitch indicates a loose spoke.

3. **Oil Level**

A constant check on lubricant levels is essential. The transmission filler cap will generally incorporate a dip stick. If the cycle engine is equipped with an oil tank, it will usually incorporate a view glass or a dip stick. Any leaks *must be* corrected immediately.

4. **Fuel Level**

Fuel level must be checked daily. It is generally a good idea to keep the tank near full to prevent condensation and rust accumulation. Leaks (usually at the shut-off valve or carburetor) *must* be corrected immediately.

5. **Cable Adjustments**

Both clutch and front brake cable adjustments must have some "slack." The front brake should be adjusted to engage completely just before the lever touches the hand grip. These adjustments are made by turning the knurled knob at the base of the individual levers. The rear brake adjustment is at the end of the brake rod at the rear wheel. An adjustment nut compensates for brake wear. Some free travel should be maintained to prevent excessive brake lining wear.

Note — The point at which the cables pivot and enter the cable sheath must be lubricated frequently to prevent breakage.

6. **Chain**

With the driver in place the drive chain should have no more than a three-fourth inch of "slack" on the lower side. A loose chain will wear the sprockets excessively and may slip entirely off the sprockets.

B. Periodic Maintenance Checks

1. **Chassis**

Tighten all loose bolts and screws. A loosened component could cause a dangerous situation that might become uncontrollable while riding.

2. **Battery**

The motorcycle battery is wet-celled. The water level must be maintained to prevent damage to the cells and a loss of electrical power.

3. **Controls and Cables**

An extensive check of all controls and cable ends should be made and lubricant applied to areas subject to wear.

4. **Brakes**

Generally, brake lining life expectancy is 15,000-20,000 miles.

5. **Ignition System**

Spark plugs require periodic cleaning which can be accomplished with a wire brush or sand blaster. Other ignition repairs should be left to a competent repair man.

6. **Power Chain**

The power chain should be removed from the cycle for cleaning, inspection, and lubrication periodically.

UNIT C
RIDING THE MOTORCYCLE

I. Protective Equipment

Objective — Describe the necessary protective apparel and purpose for its use.

A. Protective clothing and headgear are important factors in driving motorcycles just as seatbelts are important to an automobile driver.

1. **Helmets**

a. Protective headgear will be worn by a driver and passenger of the motorcycle.

b. Over 51% of motorcycle fatalities are caused by head injuries.

c. The helmet should be comfortable but securely strapped on to prevent its coming off during a spill.

d. Only D.O.T. or equivalent-type approved helmet will be worn.

e. The helmet should not be worn beyond the recommended protective life of the helmet as recommended by the manufacturer (most helmets are safe for four years).

2. **Gloves**

a. Most individuals instinctively throw out their hands when falling; thus, gloves are essential in preventing injuries to the hands, particularly painful palm abrasions.

b. Gloves also provide warmth during cold weather and will keep fingers flexible for proper coordination of quick reflexes.

3. **Glasses or Goggles**

a. Eye protection is essential for safety.

1) At high speeds, bugs and grit in the air can penetrate the eyes.

2) Occasionally, rocks are kicked up into a driver's face by other vehicles or by his own.

3) Without eye protection, wind may cause eyes to water, thus reducing acuity and depth perception.

b. Eye protection includes goggles and half- or full-face shields.

1) Goggles are strongly recommended for driver's use when not required by law.

2) Goggles must be of approved type (plastic shatterproof lenses).

3) Cyclists must have different lenses (clear) when riding at night.

4) Face shields have a tendency to "mist" when used in cold weather, thus reducing visibility.

4. **Footwear**

a. Boots, high-top shoes, or oxford with a hard sole should be worn to prevent skinning the feet and twisting ankles.

b. Hard, solid soles may prevent a crushed foot.

5. **Protective Clothing**

Clothing should be selected for the protection of the body against abrasions and for warmth during inclement weather.

a. Leather is the best fabric for protection. Heavy nylon fabric is next best and the third choice is denim.

b. One should not ride in short pants and T-shirts.

6. **Impediments to Vision**

The motorcycle presents a smaller area to the eye when seen from any angle, especially when viewed from the front or rear. Due to this visibility handicap and the unfamiliarity of the motoring public with motorcycle characteristics, it is the cycle driver's duty to make sure he is seen by other motor vehicle operators.

a. White, yellow, orange, or other light colored garments help the motorcycle driver to be visible to drivers of automobiles.

b. Bright-colored helmets also assist drivers of other vehicles to notice the motorcycle driver.

c. Use reflective materials (paint, tape) on helmet, cycle, and clothing.

II. Laws of Nature

Objective — To familiarize students with the laws of nature that interact with the motorcycle.

A. Man-made laws and natural laws differ because man's laws are not always enforceable, but nature's laws always hold true. Man must then learn, study and apply nature's laws as he drives. The motorcycle is completely subject to nature's laws; and man, the driver, cannot break them. His attempts invariably result in failure and sometimes tragedy. Knowing this, the intelligent driver will obey nature's laws. Nature's laws are immediately enforced.

B. Group discussion. Describe swinging ball on a string. If string breaks, the ball keeps going. This can be related to driving. Allow students to discuss this concept.

C. **Friction**

Friction is the resistance to motion between two surfaces.

1. Four basic kinds of friction are
   a. **static friction** — the holding force between two surfaces at rest,
   b. **sliding friction** — the resistance to motion between two surfaces which are moving across each other,
   c. **rolling friction** — the resistance to motion of a rolling object like a ball or a wheel, and
   d. **internal friction** — the resistance to motion within elastic objects.
2. The amount of friction between two surfaces depends upon the
   a. substance of the material — the softer the material the greater the friction,
   b. roughness of the surface — the rougher the surface the greater the friction,
   c. the amount of force pushing the surfaces together, and
   d. the presence of lubricants between the surfaces which tend to hold the surfaces apart and thus reduces friction.
3. The coefficient of friction or the amount of friction between two surfaces is calculated by dividing the amount of force necessary to pull one surface over another by the amount of force pressing the two surfaces together.

Traction

Traction is the amount of friction between a tire and the road surface.

1. Traction is needed on the wheels to make the cycle go, on the front wheel for steering, and on both the rear and front wheels for directional control and braking.
2. It takes more force to start a cycle moving than it does to maintain movement because static friction is greater than sliding friction and inertia must be overcome to start the cycle moving.
3. A spinning wheel does not provide as much traction as a rolling wheel; therefore, the skill of starting a cycle on a slippery surface lies in applying the power to the wheels so that they do not lose their grip on the surface.
4. Normally, a cycle moves in the direction the wheels point because the rolling friction against wheels moving backward or forward is less than the sliding friction of sideward movement. Exceptions are
   a. when the centrifugal effect in a turn is greater than the frictional force of the tires, the tires will slide sideways; and
   b. when brakes are applied hard enough to slide the tires, there is no rolling friction.
5. Although traction is increased by the weight of the cycle, a heavier cycle will not stop in a shorter distance because the added traction is balanced by the added inertia of that increased weight.
6. Some factors affecting traction are
   a. type of road surface material,
   b. dry or wet surfaces (wet loses traction),
   c. first few drops of rain may float oil, grease, or dirt to the road surface thereby reducing traction,
   d. loose sand, gravel, mud or dirt on the roadway,
   e. ice and snow, and
   f. amount of tire tread.

Centrifugal Force

As a motorcycle rounds a curve, centrifugal force causes the passengers to tend to keep moving in a straight line. This is actually the straight line force of inertia, but for understanding and convenience, the term *centrifugal force* is used.

Types of Roadways

There are several types of roadways which should be considered in any discussion of friction or traction. They are as follow:

1. Flat road — Roadway does not slope at all. For a cycle to round a curve on a flat surface more friction is needed; therefore, a slower speed is recommended.
2. Banked roadway — A roadway that is sloped

upward at the outside of a curve. This curve requires less friction and is the safest type of roadway.

3. Crowned roadway — A roadway that is higher in the center than at either outer edge. This downward tilt adds to the centrifugal effect and makes the motorcycle more likely to tip over or to skid.

Gravity

Gravity can be defined as the force that pulls all objects toward the center of the earth. On a motorcycle, one feels the effect of gravity while he is going up a hill or downhill. Gravity pulls a cycle downhill faster and also slows the cycle as it goes uphill.

Kinetic Energy

Kinetic energy is the energy of motion. The faster a motorcycle moves, the greater its kinetic energy will be. To the rider, this means that a greater distance must be allowed for stopping. If one doubles the motorcycle's speed, one increases its kinetic energy four times. If one triples the speed, one increases the kinetic energy nine times. Kinetic energy increases by squaring the increase in speed.

The formula for figuring the kinetic energy of a body is as follows: Where M is the body's mass or weight, and V is its speed, kinetic energy (KE) is written this way: $KE = \frac{1}{2}MV^2$

Force of Impact

The striking force of bodies when they hit something is called the force of impact. The factors that decide how great the force of impact are

1. speed,
2. weight, and
3. distance between impact and stop.

Like kinetic energy, the force of impact varies with the square of the speed.

III. Man-made Laws

Objective — To instruct students in the use of signs, signals, and road markings.

A. Knowledge of Alabama traffic laws can be obtained by making a careful study of Alabama Drivers' Guide. Special attention should be given to the following:

1. Alabama Traffic Regulations
2. Alabama Safety Responsibility Law
3. Safety Rules and Practices in Alabama
4. Registration and Equipment Regulations in Alabama

B. The red, yellow, and green lights that most people call "traffic lights" are known to traffic engineers as traffic control signals. The standard light colors and their meanings are

1. Red — Stop,
2. Yellow — Do not enter the intersection or clear the intersection,
3. Green — Go when safe,
4. Flashing red — Stop, proceed when safe,
5. Flashing yellow — Caution, and
6. Green arrow — Traffic moving in the direction of the arrow may proceed.

The standard order of the traffic control signal is green-yellow-red. For color-blind riders, distinction may be made according to position. Vertically, the red light should always be on top, yellow in the center, and green on the bottom. When placed horizontally, red should be on the left, yellow in the center, and green on the right.

Lines, lettering, and symbols on the pavement are often used to give information to riders. Traffic lane markings are one example. Others are pedestrian crosswalks, vehicle stop lines, no-passing zones, and left, right, and straight ahead lanes. Curbs are often painted yellow to show no-parking areas. Sometimes individual parking places are marked by lines painted on the pavement. The good rider looks for and drives in conformance with pavement markings.

The colors, shapes, and markings of traffic signs have been standardized so that they can be quickly and easily recognized throughout the country. Adoption of these uniform standards has been a significant contribution to safety and convenience of all who use the highways. Some of the different types of signs are

1. **Stop** — Stop means to come to a full stop and proceed when clear. The stop sign is usually red, but some are yellow. They are octagon shaped.
2. **Warning Signs** — Warning signs warn drivers of hazardous conditions either on or adjacent to roadways and give drivers time to take appropriate action. These signs are usually diamond shaped and yellow in color.
3. **Guide Signs** — Guide signs are of three principle types:
   a. route markers — identify the highway by number and symbol as part of a national, state or local network,
   b. destination and distance signs — show directions and mileage to cities, towns, or other places ahead, and
   c. informational signs — give items of interest to travelers on the highways.
4. **Interstate Highway System** — These signs are colored in distinctive red, white and blue. Even numbers designate interstates running east and west, while odd numbers designate

north and south routes. An interstate with three numbers, such as 275, indicates a loop around a heavily populated or urban area.

5. **Regulatory Signs** — These signs inform highway users of certain traffic laws or regulations which apply to those sections of roadway where the signs are placed. Failure to comply with the directions indicated on these signs constitutes a violation of law.

C. **Yield** — Yield means to yield the right-of-way to another vehicle or pedestrian. To aid states in developing right-of-way rules, the Uniform Vehicle Code suggests four basic rules. They are as follow:

1. If two vehicles are approaching or entering an uncontrolled intersection at the same time, the driver on the left shall yield the right-of-way to the driver on the right.
2. Drivers shall yield the right-of-way to pedestrians crossing at intersections in accordance with regulations and those crossing at marked crosswalks between intersections.
3. A driver intending to turn left shall yield the right-of-way to vehicles approaching from the opposite direction and to those within the intersection or so close to it as to constitute an immediate hazard.
4. A vehicle emerging from a driveway shall yield the right-of-way to vehicles on the street or highway and to pedestrians on the sidewalk.

Right-of-Way — The ability of a rider to know who has the right to proceed and who must yield.

Basic Speed Limits — Under this type of speed limit, the driver must drive at a speed which is reasonable and proper for existing conditions.

Absolute Speed Limit — Under this legal speed limit, the maximum speed is posted in miles per hour. These limits are always set for ideal conditions.

Prima Facie Speed Limits — Also known as flexible speed limits, they recognize that no one fixed speed limit is correct for a particular place at all times and under all conditions.

Merging Traffic — Traffic which blends smoothly and easily into an established line of traffic from another lane or roadway.

D. Several different kinds of agencies for public education, in the interest of highway safety, have been set up at the state, county, and city levels. Among the most active are the boards of education, safety councils, traffic safety commissions, and associations.

The major purpose of the educational approach to achieving traffic safety is to build public support for all measures that will increase support for traffic safety and for the police and courts. These governmental and private agencies also support needed safety legislation and organized programs of driver education.

E. Laws pertaining to motorcycles in Alabama.

1. Definitions pertaining to motorcycles
   a. **Motorcycle** — Every motor vehicle designed to travel on not more than three wheels in contact with the ground.
   b. **Motor-Driven Cycle** — Every motorcycle, including every motor scooter, with a motor not to exceed five horsepower, and every bicycle with motor attached. This shall include every motorcycle weighing less than 200 pounds fully equipped.
2. Operator's license

   SS 131. Registration; operator's license. — Every person except a person holding a driver's license issued under authority of chapter 2 of Title 36 of the 1940 Code, before operating any motor-driven cycle upon a public highway in this state, shall register it with the director of public safety and procure an operator's license. Operators' licenses shall be issued under and be governed by the provisions of chapter 2 Title 36 of the 1940 Code, except that such a license shall be issued to any person fourteen years of age and older if such a person can satisfy the director of public safety or an examining officer that he is competent to operate a motor-driven cycle with safety to persons and to property. (1949, p. 1007, SS 3, appvd. September 19, 1949.)
3. Every person riding or operating a motor-driven cycle shall be granted all the rights and be subject to all the duties, regulations, and penalties applicable to the drivers of other motor vehicles.
4. Before operating any motor-driven cycle upon a public highway in this state, the owner shall register it with the director of public safety and procure an operator's license.
5. Manner of riding
   a. Motorcycle will not be used to carry more persons at one time than the number for which it is designed and equipped.
   b. A person operating a motor-driven cycle shall not ride other than upon or astride a permanent and regular seat attached thereto.
   c. Every person operating a motor-driven cycle upon a roadway shall ride as near to the right side of the roadway as practicable.
   d. Motorcycles will not ride more than two abreast.

e. When driving a motorcycle the driver must keep at least one hand upon the handlebars.

6. Lights, reflectors, and warning devices

a. Every motorcycle driven after dark must have at least one but not more than two headlights.

b. Every motorcycle driven after dark must have a rear reflector, a lamp emitting a red light, and a stop light.

c. Every motorcycle will be equipped with a horn, bell, or other device capable of giving an audible signal.

7. Every rider or operator of a motorcycle will wear a protective helmet while operating the vehicle on a public highway.

IV. Traffic Situations and Adverse Conditions

A. Tailgating

A tailgater is a driver who follows another vehicle too closely. They were given this name by truck drivers because of driving so close to the tailgate of trucks. A tailgater is a potentially dangerous driver because

the vehicle he is behind blocks his view of the total traffic picture ahead;

he lessens his ability to turn into another lane. He is so close to the vehicle ahead that he has to turn sharply into a vacant lane;

he shortens the time he has to react, as well as the distance in which he has to stop; and

he has to constantly brake or accelerate to stay behind the driver ahead.

The skillful rider uses a space cushion when he rides. This constant separation from the vehicle ahead enables him to operate his vehicle smoothly and efficiently. It must be remembered here that the old rule of one car length per ten miles per hour is not enough at freeway and open highway speeds.

Use of the horn

The horn should be used primarily as a warning device. It should be used if another vehicle is being passed, a bicycle or pedestrian is near, or at any time that it is needed. It should not be used as a method of hurrying another driver or of harassing another driver.

Speed control

Proper choice of speed is a major tool to be used in coping with highway hazards. As speed increases, the time available for identifying, predicting, deciding, and executing decreases.

1. Objects and obstructions on or near the intended path of the vehicle (rocks, glass, barricades, fallen branches, curbs, poles, mailboxes, etc.) create hazards that riders must reckon with by speed and/or direction adjustment.

2. Accurate speed adjustment is particularly critical on older roads built for vehicles of their day. These roads are frequently inappropriate for the characteristics of modern vehicles. Some examples are

numerous curves and hills,

narrow lanes and bridges,

low, narrow, and soft shoulders,

many near-roadway obstacles,

changes in the number of lanes,

no markings or poor markings, and

g. deteriorating edges, chuck holes, etc.

3. Any speed can be excessive.

4. The small amount of time gained by increased speed (80 miles per hour compared to 70 miles per hour) does not justify the added risk.

5. A rider's sense of speed, not particularly keen at best, is distorted further under certain conditions (velocitization).

a. The type of vehicle being ridden affects the driver's sense of speed (height of eyes above the road, noise level, and vibration level).

b. There is a tendency for sustained high speed driving to dull a driver's judgment of speed.

c. Glancing frequently at the speedometer will help the rider to remain aware of the speed (particularly important on the freeway exit ramps and for a time after leaving the freeway).

6. Going too slow is often dangerous because more vehicles are passing.

Safe following distance

1. To be prepared for unexpected moves by the vehicle(s) ahead, maintain proper following distance and watch for conditions which would cause the rider to slow or stop.

a. So that one can adjust for fluctuations in the speed of traffic ahead without sharp braking or acceleration, he should allow reaction time distance plus a *generous* margin of safety.

1) His braking distance may exceed the braking distance of the vehicle in front.

2) If the preceding vehicle hits something, it may stop far short of its nor-

mal braking distance.

3) Lightweight motorbikes may be stopped in a shorter distance than an automobile below 25-30 miles per hour; therefore, it is necessary to increase the following distance. In addition, motorbikes and motorcycles can topple during an emergency stop or from striking an object on the roadway.
way.

b. It is wise to allow a much wider margin of safety when traveling at high speed, at night, or on slippery surfaces.

1) On freeways there is virtually no such thing as a "minor" rear-end collision.

2) Braking distance is more unpredictable on slippery surfaces.

3) It is more difficult at night to detect conditions ahead which could cause preceding vehicles to reduce speed suddenly.

c. By riding too closely to the vehicle in front,

1) One must work harder to keep his vehicle in its lane, because he is tracking on the vehicle ahead rather than on a point down the road.

2) Speed control will be erratic as one tries to judge and adjust distance behind the vehicle ahead.

3) One's view of conditions ahead and to the sides (escape route) is limited.

d. When one maintains a proper following distance, he will occasionally encounter the annoying problem of the "compulsive gap-filler."

1) One should simply drop back and reopen a space for his protection.

2) One cannot cure the intruder by an emotional outburst or by competing with him.

3) One will actually lose little time even though this experience happens a number of times on a given trip.

4) One can help to preserve a safe gap ahead of his vehicle by making sure that, while adequate, it is not big or inviting especially in heavy traffic.

e. By being alert and anticipating slow downs or stops ahead, one will rarely need to use all of the space cushion or resort to a screeching, lurching "panic stop." Some warning clues are

1) a traffic light that is green for a long time ("stale green"),

2) a vehicle preparing to turn,

3) a driver trying to force his way into another lane,

4) children playing near the road,

5) a person getting out of a parked car on the street side, and

6) a street repair job that is causing a bottleneck.

f. At higher speeds there is a tendency to underestimate the rate of closure between one vehicle and the preceding vehicle (particularly dangerous in the case of a farm vehicle ahead).

g. During freeway driving, be prepared to adjust speed and lane positions to assist other vehicles as they enter and leave the freeway. If there are many entrances and exits, it may be better to drive in the second lane from the right.

h. By placing headlights on low beam, one will avoid blinding the driver of the preceding vehicle with his headlights at night. (This is a law in some states.)

i. If one is driving a motorcycle, he should position his vehicle so that the driver in front can see him in his rearview mirror.

2. To some extent, one is at the mercy of the driver following him, but there are some measures under one's control which can reduce the probability of conflict.

a. Dispose of the "tailgater" by accelerating, decelerating, or moving into a slower lane. (Let him pass!)

b. Be alert to conditions ahead so as to avoid sudden or needless stops.

c. Flash stoplights by "pumping" the brake pedal and use a vigorous arm signal to warn an overtaking operator who seems unaware that one's vehicle is slowing down.

d. When turning off a road, do it as quickly as circumstances permit, especially on left turns.

e. Be sure that taillights, stoplights and turn signals are working properly.

f. Avoid slowing or stopping not required by traffic conditions — to admire scenery or to check a street address.

1) An operator doing 35 miles per hour in a stream of vehicles moving at 60 miles per hour, *relatively*, is driving at 25 miles per hour directly against the flow of traffic in his own lane.

2) Again, relatively, he is backing up at

that speed and is not even looking in that direction.

g. Signal well in advance of turning and turn from the proper lane.

h. Never stop on the highway — if a turn is missed, continue to the next turn-off.

i. Before changing lanes

1) Check the rearview mirrors to see if a safe gap is open, or soon will be open, in the lane where one intends to go.

2) Use turn signal and give the operators concerned with one's turn, time to perceive the signal.

3) Take a quick but adequate glance over one's shoulder, on the side of the intended turn, to cover the "blind spot."

4) Assuming all-clear ahead, move promptly into the desired lane and stabilize the vehicle.

j. Techniques applied on freeway approach ramps and acceleration lanes are similar to those used in lane changing.

1) Evaluate the location and speeds of vehicles on the freeway and also any vehicles in front on the ramp or acceleration lane. A rearview mirror will not give the full picture so one must use short, quick glances over the shoulder.

2) Tentatively select a gap in traffic that will permit one to enter the freeway.

3) Build up speed to coincide closely with traffic flow.

4) Merge smoothly with the outside lane as lane markings and traffic permit.

5) Obtain freeway speed as quickly and safely as possible so as not to cause congestion.

k. When preparing to leave a freeway, the rider should be aware that the traffic to the rear becomes increasingly important.

1) Signal early.

2) Position the motorcycle to the right of the lane.

3) Flash brake lights if traffic is closing in at a high rate of speed.

4) Avoid slowing down too much while still on a through lane, but quickly conform to advisory speeds for the ramp.

5) If the intended freeway exit is missed, drive to the next exit regardless of the distance. If one turns off at the wrong exit, one should return to the freeway at an entrance point. (Never back up!)

Emerging

The safe motor vehicle operator should always stop and yield the right-of-way when emerging from an alley or private drive into the traffic flow. The rider should also yield when crossing a sidewalk on which pedestrians may be walking.

B. Front and rear relationships in traffic are always important to the rider. A rider's intention to turn or stop should always be signaled well in advance, at least 100 feet prior to the execution. Remember to yield the right-of-way, especially on any left-hand turn.

In multilane situations, care must be taken to be in the proper lane well in advance of the turning place. If a lane change is involved, use the standard procedure of checking the mirror, signaling the intention, checking over shoulder, and moving smoothly into the lane of traffic.

The same rule applies for parking. Always signal the intention and flash the brake lights immediately before stopping. It should also be remembered to give a signal when leaving a parallel parking space.

C. View obstructions are "occupational hazards" in driving. The unnecessary ones should be eliminated and the others adjusted for by the vehicle operator.

1. Operators can reduce the view obstruction hazard caused by parked and moving vehicles by adjusting their space relationship to the other vehicles.

a. Trucks are a problem because one cannot see through them to identify other traffic.

b. In rain, trucks throw a spray of water that interferes with vision in a passing maneuver.

2. Operators can reduce the problem of barriers to sight, such as a building, a blind corner, or a parked car, by expecting potential hazards behind the barriers. (Unfortunately, for some operators, potential hazards do not have the potency of visible hazards; and, thus, these drivers play Russian Roulette.)

3. One of the most practical and least costly measures to improve the operator's visibility is to eliminate billboards, bushes, trees, poles, and cars parked near intersections.

D. **Weather conditions**

Weather conditions may reduce visibility, thereby adding the limitations of night driving to a daytime situation; or they may compound the normal visibility problems associated with nighttime driving.

1. Rain, particularly at night, can distort vision because the wet surfaces reflect all the lights, thus creating a maze to be driven through.
2. Aside from helping the oncoming operator to see one's vehicle, switching lights on in a heavy rain also helps the driver directly ahead whose back window is rain splattered. An unlighted vehicle is difficult to detect in a mirror during a heavy daytime rain.
3. Low-beam headlights are more effective in fog (rain and snow also) because fog is made up of tiny particles of water that act like mirrors to reflect high-beam lights. In light fog, high beams may show more of the roadway, in spite of the glare.
4. The face shield used by the two-wheeled vehicle operator will impede vision when wet; and it will fog up in cool weather, when the vehicle is not in motion.
5. In fog, heavy rain, or snow, and other times when visibility is extremely poor, drive slowly, hug the side of the road, and glance frequently at the edge of the road to keep good bearings.
6. The sun can be a particular hazard because the eye adapts slowly to changes in light intensity.
   a. When facing the blinding effect of the sun — early morning and late afternoon — a driver can improve his vision by keeping the windshield clean, properly positioning the sunvisor(s), and wearing sunglasses.
   b. When driving away from the sun, one should not assume the oncoming operators can see you; they may be blinded by the sun. (Turn headlights on.)
   c. After hours of driving in the bright sunlight, visual efficiency is reduced at dusk and in darkness.

Nighttime driving

Due primarily to reduced visibility, critical phases of the operator's task are more difficult under nighttime driving conditions, and the competent operator adjusts for these differences.

1. The flood of detail available to help the operator during the daytime is reduced appreciably at night.
   a. Aside from reducing detail, darkness conceals hazards (the pedestrian, the two-wheeled vehicle, the stalled car, the curve, and other objects or conditions); hence, the operator makes a decision on the basis of a sketchy and incomplete picture.
   b. It is more difficult to judge the speed and position of another vehicle at night.
   c. Operators must depend largely on their headlights which illuminate only a relatively short and narrow path ahead and do not bend around corners.
   d. The amount of adequate highway lighting is limited.
   e. Glare from roadside lighting and the headlights of oncoming vehicles impair visibility.
2. The following rules should be observed to compensate for the handicaps imposed by darkness.
   a. Reduce stopping distance by slowing down so that it will be possible to stop within the visible distance.
   b. Increase sight distance by keeping the headlights clean and properly aimed.
   c. Watch beyond the headlights on or near the roadway for slow moving or unlighted vehicles, curves and T intersections, road obstructions or defects, trains, pedestrians, and animals.
   d. Avoid looking directly into glaring headlights of oncoming vehicles.
   e. Increase following distance.
   f. Allow a greater margin of safety when overtaking and passing.
   g. Be especially careful to observe and obey fully all rules of the road and all traffic signs and signals.
   h. Do not wear sunglasses or tinted face shields at night.
   i. Keep face shield clean and free of scratches which will increase glare at night.
3. When visibility is reduced by darkness or weather conditions, other operators are similarly hampered.
   a. Clear and timely signalling of an intention to slow, stop, or turn is more important than ever at night.
   b. Be sure that taillights, back-up lights, license plate lights, and turn signals are functioning.
   c. Turn low-beam headlight on at dusk and during the daytime periods of low visibility so that other operators will be able to see you.
   d. Use low-beam headlight when an oncoming vehicle is approaching, regardless of what the other driver does and also when following or passing another vehicle. A quick flash of high beam may be used to indicate a pass.

E. The proper procedures for right and left turns will be covered in the laboratory phase of driver education, but they are also worthy of mention in the classroom.

Left turns

1. Check traffic forward
2. Check mirrors
3. Position motorcycle in proper lane
4. Signal
5. Reduce speed
6. Check intersection traffic
7. Center motorcycle in proper lane

Right turns

1. Check traffic forward
2. Check mirrors
3. Position motorcycle in proper lane
4. Signal
5. Reduce speed
6. Check intersection traffic
7. Center motorcycle in proper lane

F. **Passing**

Safe and efficient passing hinges upon good judgment plus a systematic pattern of action.

1. By staying well back of the vehicle to be passed, the operator is in a better position to
   a. check the variables ahead which affect his decisions,
   b. accelerate and quickly gain a sufficient superiority of speed when the way is clear, and
   c. stabilize his vehicle in the passing lane before drawing abreast of another car.
2. Pavement markings and signs aid the operator in making a "passing" decision; but he must search for additional information before deciding whether this crucial maneuver is worthwhile, legal, and safe. (When in doubt, don't!)
   a. Grades (vertical curves) on undulating roads were built for cars a foot or two higher, making it difficult to see modern cars in the dips.
   b. The size and color of oncoming vehicles influence the distance judgment of the perceiver.
   c. The operator's view will be obstructed if he follows another as it passes; and, in addition, there may not be sufficient space for him to return to the right lane.
3. Communicating one's intention to pass (horn or lights) reduces the chance that the operator being passed will swerve in front of him.
   a. Avoid passing if the operator ahead is about to pass a pedestrian, cyclist, animal, or anything which could cause him to swerve suddenly.
   b. Avoid driving alongside in "blind spots" of the other driver longer than necessary.
4. If the operator withholds his final decision to complete the passing maneuver until he is in the passing lane near the vehicle being passed, he will have more time to assess the situation ahead and also better prepared mentally to brake and pull back into the right lane should an obstacle appear in the path ahead.
   a. The decision is *tentative* until that point.
   b. However, the operator should proceed to the point of final decision as if he were going to complete the pass.
5. If for any reason the vehicle being passed demonstrates erratic behavior before the point of decision is reached, drop back into the right lane and re-evaluate the situation.
6. By building up a clear superiority of speed over the vehicle being passed, the operator minimizes the time he is exposed in the passing lane.
   a. A 15 miles per hour superiority means approximately 8 seconds in the passing lane.
   b. The time required for passing when 15 miles per hour superiority has been built up is the same regardless of the speeds of the two vehicles, *but the distance used up in passing increases as the speed increases.*
   c. Almost one-half mile is needed to make a safe pass at 65 miles per hour if another vehicle is coming from the opposite direction at the same speed.
   d. More time is required to pass a truck, bus, or trailer. (Trucks pick up speed on downgrades so you must catch a truck at the beginning of the downgrade to pass.)
   e. Because of air resistance and a reduction of power available at the rear wheels, it takes longer to accelerate and pass at high speeds: (1) acceleration power decreases as speed increases — it takes longer to accelerate from 60 miles per hour to 70 miles per hour than it does from 50 miles per hour to 60 miles per hour, and (2) this is true of every cycle, but each cycle has a variable rate of acceleration.
7. By remaining in the passing lane until the front of the car being passed appears in the rearview mirror, the driver is assured that he can return to the right lane without cutting off

the passed vehicle.

a. A brief glance over the right shoulder is a good habit to develop, particularly in congested, urban areas.

b. Give the operator being passed the following distance that you would like to have.

8. The same key passing rules apply on four-lane, undivided highways as on two-lane, rural highways except

a. the passing differential in speed is not so crucial as it is on a two-lane highway;

b. instead of judging the pass to reduce exposure in the passing lane, one needs a steady speed, flowing and blending with the traffic;

c. passing on the right is permitted.

9. In a passing situation, if one misjudges the speed and distance of an oncoming car, he should

a. try to brake and fall back behind the vehicle he intended to pass;

b. accelerate and return to the lane ahead of the vehicle he is passing;

c. not consider the choice of swerving off to the left when an oncoming vehicle is close since it is the best escape route.

10. When being passed, maintain an even speed; but if the passing operator misjudges the distance of an oncoming vehicle, one may be compelled either to

a. accelerate and let him drop back into the lane he was in (make certain that this is his intent); or

b. decelerate, poise foot on brake, and look for an escape route if needed.

G. Intersections

There is twice as much traffic in the space of an intersection as there is in an equal amount of space on either of the roads that intersect. On a per-foot basis, there is no place on a street or highway that has a higher traffic crash potential than does an intersection.

Also, intersections are decision points. Nowhere does a driver have to make so many decisions at once. A driver must be at his best when he interacts at an intersection. He must correctly interpret traffic lights, pavement markings, traffic signs, and the signals, placement, and speed of other vehicles. He must be able to identify danger sources and respond to them correctly.

1. Some types of intersections a driver will encounter in his day-to-day driving are as follow:

a. **Diamond** — an intersection between two streets that is diamond in shape.

b. **Cloverleaf** — a grade separation interchange, in the shape of a four-leaf clover, at the intersection of two highways.

c. **"T"** — an intersection in which one street or highway dead-ends into another. All traffic must turn from the highway which dead-ends.

d. **Four-way stops** — an intersection of two roadways where traffic from all directions must stop and proceed when clear. Generally, the vehicle that stops first moves through the intersection first; but when two or more vehicles stop simultaneously, the rider on the right usually assumes the right-of-way.

e. **Blind** — an intersection at which buildings, shrubbery, banks, or parked cars obstruct an approaching driver's view of cross traffic until he is almost in the intersection.

f. **Uncontrolled railroad crossings** — a railroad crossing at which there is no mechanical warning device. The procedure here is to always come to a full stop and proceed with caution.

2. Approach to intersection — when approaching an intersection, special considerations and checks will facilitate safe and efficient progress for the operator.

a. An intersection is not always defined by signs or traffic signals; for example, factory parking lots and shopping centers' entrances and exits often create hidden intersections in the middle of the block. Rural intersections may reveal themselves through crossing or turning cars, rows of houses, trees, fences, telephone lines, or signs.

b. An initial scanning of the intersection and traffic to the rear serves to identify those elements which will affect decisions and present potential hazards. Look for traffic controls, impediments to visions, pedestrians at an approaching intersection, and other characteristics of the intersection.

c. An appropriate approach speed — one that is sufficiently low to permit the driver to stop short of the intersection should conditions warrant such a move — depends largely on the traffic controls, traffic volume, and how much sight distance the driver has in relation to the intersecting street.

1) The shorter the unobstructed view of the crossroad, the lower the safe speed for approaching the intersection. (The intersection may necessitate a stop.)

2) When view is obstructed, reduce speed so that the point of decision can be withheld until sight distance is adequate.

3) A typical "slow down and look" approach to an uncontrolled intersection requires only a few seconds.

d. To negotiate a signalized or signed intersection, operators must apply additional knowledge and skill.

1) The mere presence of a traffic signal or a sign is a warning of a danger zone, regardless of the color of the light.

2) Occasionally, one will encounter an operator who attempts to beat the light or one who simply fails to see the light.

3) If an operator is stopped for a red signal and it changes to green, he is still required to yield to other vehicles and pedestrians lawfully within the intersection or in adjacent crosswalk at the time such a green light is exhibited.

4) Be extra alert when approaching a "stale green."

5) "Covering" the brake (foot poised on the brake) as you approach an intersection minimizes execution time distance should a stop be required.

6) Watching one's speed, the signals well ahead, and other cues will help one to pace himself with the signal's timing, especially if it is a "progressive" system.

7) Operators approaching a yield sign shall slow down or shall stop and yield the right-of-way to any vehicle in the intersection or approaching on another highway so closely as to constitute an immediate hazard. Continue to brake as at a stop sign until certain there is no need to stop.

8) Operators approaching a stop sign shall stop and *yield the right-of-way* to any vehicle which has entered the intersection or which is approaching so closely as to constitute an immediate hazard. A stop sign tells the driver that he must stop but does not necessarily tell him exactly where to stop.

9) A flashing red light has the same meaning as a stop sign; a flashing yellow light has the same meaning as a "slow" or "caution" sign. (Slow down and be prepared to stop.)

10) A green light permits the operator to proceed if the way is clear; it does not assure safe passage through the intersection.

11) When a traffic officer is on duty at a signalized intersection, his directions take precedence over the lights.

e. A careful check to the left, straight ahead, to the right, and left again will furnish the operator with the information needed to make a final decision about passing through the intersection. (Each intersection is different and may require a different search pattern.)

H. Human Factors — Natural Factors — Mechanical Factors

1. Human Factors

a. **Slow-moving vehicles** — Heavy trucks, farm machinery, and other slow moving vehicles are always a danger spot on the open highway. The cautious driver is always on the lookout for these vehicles, and he slows down in plenty of time to avoid a rear-end collision. Another problem with vehicles of this type is getting so close behind them that one cannot see traffic ahead well enough to pass. This situation should be avoided.

b. **Trucks hauling gravel or sand** — The danger from trucks of this type is that they sometimes sling loose gravel and/or sand on the motorcycle behind. This can distract the driver and sometimes cause serious accidents as well as damage to his vehicle. Also to be considered here is the fact that these heavy gravel trucks cannot stop as quickly as a lighter, unloaded vehicle. A wise driver will make sure that he has plenty of room before pulling into the path of one of these trucks.

c. **Construction areas** — Danger spots here are areas where pavement ends or where pavement is rough due to traffic by heavy machinery. Also, be on the lookout for flagmen and heavy machinery crossing the roadway.

2. Natural Factors

Natural factors generally are bad weather or effects of bad weather. Cyclists can be aware of conditions outside and try to do as little driving as possible under adverse conditions.

Some natural factors that present special problems are

a. **Fog** — Especially treacherous when it is in patches that are travelled into and out of because a light fog area can suddenly turn into an area of dense fog. In dense fog the driver should slow down to a crawl or pull well off the roadway and stop. Turn on low-beam headlights, night or day.

b. **Ice, snow, and sleet** — Also cause dangerous conditions for driving. Although only about 2% of our nation's traffic fatalities occur in snow, it is still slippery and bothersome and slows drivers down. In Alabama, heavy snow accumulations are infrequent; but when they occur, the point to remember is to reduce speed, keep snow and ice off eye protection, and proceed with caution.

c. **Rain** — More people are killed on wet roads than on ice and snow combined. Rainy weather is a factor in over two-thirds of all bad weather crashes. When it first starts to rain, slipperiness is especially bad. The water combines with oil on the pavement to produce an oily film on the road surface. Reducing speed is the major compensation needed for driving on a wet street. Also, headlights can be turned on and extra caution taken on lane changes, curves, and stops.

d. **Hydroplaning** — While driving on a street soaked by heavy rain, the wheels of a cycle can actually lose contact with the road surface and ride on a film of water. To cope with hydroplaning a driver must keep these facts in mind:

1) At 30 m.p.h. or less, tires with good tread will cut through the water and remain in complete contact with the road.
2) At 30 to 55 m.p.h., the water wedge may penetrate the tire-road contact and partial hydroplaning may result.
3) At 55 m.p.h. or more, the water wedge may increase and tires may lose complete contact with the road.

Besides speed, whether or not hydroplaning occurs depends upon the depth of water on the road surface, tire tread, tire pressure, wheel alignment, and road surface.

In general, the following are things to do in all types of bad weather:

1) Listen to the weather forecast.
2) Allow extra time even for a short trip.
3) Soon after starting, test the traction.
4) Turn on low-beam headlights in daytime.
5) Check the road surface for frost, snow, or ice.
6) Look farther ahead than usual.
7) Keep a sufficient space cushion.
8) Be alert for a feeling of skidding.

e. **Objects in road** — The safe driver should always keep his attention on his driving to avoid objects in the road. By keeping a reasonable speed, he can avoid objects such as rocks, holes, parts of tires, or any other object that may be in the road. At night, however, a driver must not overdrive his headlights; that is, drive at such a speed that he cannot stop in the distance illuminated by his headlights.

f. **Animals in the road** — Animals are unpredictable, but if an operator is alert for the potential hazard of an animal dashing into his path without warning, and adjusts his speed accordingly, collisions can be avoided.

1) It is estimated that over 10,000 deer are killed annually by vehicles.
2) Deer are attracted to roadways for feeding, and they feed mostly at night.
3) One deer often means that more deer are present.
4) It is believed that the shadow of the deer itself, caused by the vehicle's headlights, startles the deer so he bolts into the highway.
5) Observation, speed reduction, and a state of readiness are the most efficient responses for the driver when there is the possibility of an animal threatening his path.
6) Operators need to watch for dogs and cats along the roadside and adjust their speed to minimize the danger.
7) At night, the reflective eyes of an animal are a cue to the operator to be alert.

3. **Mechanical Factors**

Mechanical factors are also to be considered when talking about the critical situations of driving. Some to be on the lookout for are

a. **Overbraking** — The result of overbraking is locked wheels. After the wheels lock, there is a loss of both braking power and steering control.

b. **Blowouts** — A blown tire is one cycle failure which can turn into trouble quickly. If you have a tire blowout, do not

use your brakes. Just ease off the throttle and slow gradually. When your speed is low enough, move off the road *slowly*. There is no good way to control a cycle with a flat tire, but a firmer grip of the handlebars helps.

c. **Brake failure** — Any decrease or loss in braking power compels the operator to maintain steering and positioning control and regain speed control.

1) Brake failure or malfunction results from breakdown of some mechanical linkage within the system.

2) When brakes fail

a) find an escape route — a safe exit from the highway; and

b) while struggling to maintain steering and speed control, communicate your emergency situation to other highway users threatened by the situation.

3) In extreme cases it may be necessary to slow the vehicle by

a) running along an embankment,

b) scraping against a curb, and

c) driving into bushes, hedges, or snowbank.

d. **Light failure** — Even with careful maintenance, a critical situation involving headlight failure may arise. Sometimes one will be able to bring them back temporarily by hitting the dimmer switch, but if not, perform the following steps:

1) Slow down quickly, keep the cycle in its path, and look for an escape route.

2) While slowing down, watch for anything that can help with orientation.

3) Flash the brake lights, and turn on the right turn signal.

e. **Engine overheating** — The cycle should not be parked with the engine running for long periods of time.

f. **Stuck throttle** — When the throttle sticks, power must be cut off the drive wheels. Immediately place the gearshift lever in neutral, apply brakes, pull off the road where the throttle can be safely released and turn off the ignition. (Try to find any remedy for the trouble.)

UNIT D
BUYING AND INSURING THE MOTORCYCLE

I. Things to Consider in Selecting a Motorcycle

A. Size that can be handled
   1. Not too high
   2. Should be able to straddle cycle with both feet flat on the ground

B. One that fits owner

C. Where it will be ridden

D. An on- and off-street cycle or the on-off combination

E. Cost

F. Strength of driver and personal experience
   1. Should be able to man-handle if necessary
   2. Should be able to put it on the park stand, to push it, and park easily
   3. Larger cycles require more experience

II. Types of Motorcycles

A. **Street Cycle**
   1. Good in traffic
   2. Treads grip pavement
   3. More powerful brakes
   4. Engine and transmission designed for traffic speed

B. **Trail Cycle**
   1. Not for city nor highway driving
   2. Brakes not designed for quick stops
   3. Knobby tires do not grip pavement
   4. Light and medium in size
   5. Has special suspension for rough terrain
   6. Knobby tires with deep treads for pulling rough surface
   7. Engine with more power at low speeds

C. **Sports Cycle**
   1. Designed for racing, hill climbing, and scrambling
   2. Not to be used in traffic.

III. Classes of Motorcycles

A. **Light Weight** — up to 200 cc (term of reference)

B. **Medium Weight** — 200 cc-400 cc

C. **Heavy Weight** — over 400 cc

IV. Insuring the Motorcycle

A. Insurance is necessary for the protection of the owner and machine

B. Types of insurance
   1. **Liability**
      a. Pays for injury to others only
      b. Liability differs among states
      c. Comment on Alabama's negative requirement
   2. **Collision** — pays for damage to owner's motorcycle regardless of who is at fault
   3. **Comprehensive** — covers for theft, vandalism, storms, and falling objects
   4. **Uninsured Motorist** — covers damages when other party has no insurance
      (May pay only bodily injury)
   5. **Passenger** — pays for damages to a rider
   6. **Medical Payment** — pays for damages obtained in an accident
   7. **No Fault** — usually not applicable to owner's motorcycle

Range Operation

UNIT A
INTRODUCTION TO RANGE OPERATION

Range operation provides the means of permitting the student-rider to practice and develop essential skills within a secure environment and under highly controlled conditions.

This section presents a system of devices and methods consistent with the goal of fostering good motorcycling habits.

The immediate goals are two-fold; namely,

1. To prepare the student-rider for range-riding, and
2. To insure a safe, smooth-functioning range program.

I. Range Communication

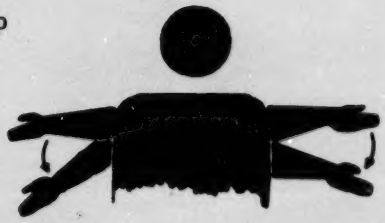
Complete control over the vehicles will be maintained at all times, both on and off the range by the instructor or his designated assistant from a fixed location. Both audio and visual signals will be used either together or individually. Students will be thoroughly briefed before proceeding any further. Complete control is the key to a safe operation. The following devices are suggested:

A. Audio signals such as whistles

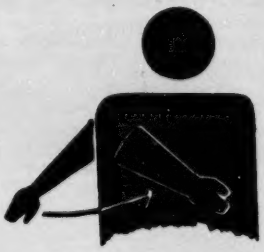
B. Audio amplified devices such as P.A. systems, bull-horns, megaphones, etc.

C. Standard hand signals

Speed-up



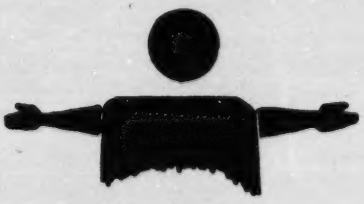
Slow down



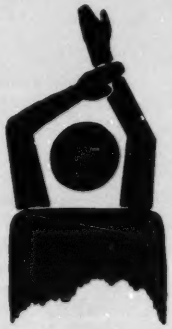
Move forward in this direction

Assemble here — left hand indicates area

Start



Stop



Cut engines or end practice drill

II. Protective Clothing

No student under any circumstances will be permitted to mount a motorcycle unless fully outfitted in protective clothing. This protective gear will be worn at all times and maintained in serviceable condition.

A. The head shall be protected by the wearing of a "D.O.T." (Department of Transportation) approved motorcycle safety helmet, one helmet per rider correctly seated on the head with the chinstrap securely fastened.

B. The eyes shall be protected by the wearing of, or the use of

1. a face shield secured to the helmet,
2. safety-type goggles securely fastened, and
3. a windshield positioned to protect the face and eyes.

C. The upper limbs shall be protected by the wearing of

1. a heavy full-length jacket, and
2. leather or heavy-duty work gloves.

D. The lower limbs shall be protected by

1. full-length heavy-duty trousers, and
2. boots or high-top shoes.

E. One-piece special motorcycle protective clothing may be substituted for like clothing as listed above.

III. Maintenance

It is essential that all motorcycles be maintained and ridden in an optimum condition; therefore, before any motorcycle is ridden, the following items will be checked thoroughly:

A. **Wheels and tires**

1. Tires for proper inflation, excessive tread wear and cuts
2. Wheels for bent spokes, dented and cracked rims
3. Wheels for excessive play

B. **Power chain**

1. Proper tension
2. Excessive play or too tight

C. **Fuel and oil**

1. Proper levels
2. Leaks and drainages
3. Place fuel supply lever into "*on*" position at this time

D. **Brake and clutch cables** for proper tension

E. Unlock anti-theft lock (wheel) at this time.

F. Safety devices (ignition switch "*on*"). All lights and indicators must be operational and all lenses clear.

1. Instrument indicators
2. Head light, both beams
3. Brake lights
4. Taillights
5. Turn indicators
6. Rearview mirrors

IV. Mounting and Starting Procedures

Motorcycles will be mounted and engines started only upon the command or signal of the instructor.

A. **Mounting the motorcycle**

1. While standing on the left side of the motorcycle, firmly grip both handles of the handle bars and tilt the cycle to the left.
2. Mount the cycle by throwing the right leg over the rear of the cycle.
3. Both feet must be able to rest upon the ground when astride the motorcycle. No student will be permitted to operate a cycle if unable to do so.
4. Adjust the rearview mirrors from a riding position one foot on the ground.
5. With both feet on the ground, roll the cycle back and forth until the cycle is placed in neutral.

B. **Starting the motorcycle**

1. Recheck the fact that the gear change lever is in a "neutral" position. (Develop a habit in keeping the clutch lever *in* when starting.) If "neutral" indicator is installed, look for a green light.
2. Make sure the "kill" switch is off.
3. If the engine is "cold," pull out the "choke."
4. Open throttle part way by rolling it back, knuckles up.
5. Lean the motorcycle slightly to the left, away from the kick stand.
6. Unfold the kick starter pedal, placing the right foot on the pedal and positioning it slightly behind the ball of the foot.
   a. Push the starting lever down sharply several times by extending the leg. Do not allow the lever to snap back.
   b. Repeat, if necessary.
7. If motorcycle is equipped with an electric starter, it may be used; however, try to conserve battery as much as possible.
8. When the engine starts, close the throttle and do not race the engine.

9. Allow kick starter to return to starting position and fold in peg.
10. Adjust the choke until the engine is running smoothly.

V. Shutting down — Dismounting — Locking Up

A. **Shutting down the engine**

1. Place gear change lever into neutral.
2. Kill the engine with kill switch.
3. Turn the ignition switch off.
4. Place in first gear to prevent possible rolling.

B. **Dismounting the motorcycle**

1. Swing back to the left side, holding both grips.
2. Turn off gas supply with fuel supply lever in the "off" position.
3. Remove the ignition key.

C. **Locking up**

1. Turn steering wheel to the left.
2. Lock with key or bracket.

VI. Kickstands and Operation

Since both parking stands are spring-loaded, they will automatically assume a locked position once started in either an "up" or "down" position.

A. The center stand is the most stable.

1. To lower the stand
   a. grip the handle bar with the left hand,
   b. push the "center stand" down with the right foot,
   c. roll the motorcycle backwards, at the same time pulling up on the "hand" grip with the right hand, and
   d. with the right foot holding the stand, continue pulling the motorcycle backwards and up.
2. To raise the stand (reversed order)
   a. grip the handle bar with the left hand and the hand grip with the right hand,
   b. place the right foot against the "center" stand,
   c. pull up and forward on the hand grip, at the same time rolling the motorcycle forward, and
   d. grip both handle bars and place upon "back" stand if not using immediately.

B. The "kick" stand is the least stable but the easiest to use.

1. To lower the stand
   a. from the left side of the motorcycle, grip both handle bars,
   b. lean the motorcycle slightly outwards,
   c. place the right foot on the kick stand and press downwards,
   d. lean the motorcycle inwards and onto the kickstand, and
   e. turn the handle bars inwards and the steering wheel to the left.
2. To raise the "kick" stand (reversed order)
   a. straighten the handle bars while standing on the left hand side of the cycle,
   b. lean the cycle slightly outwards, releasing pressure on the kickstand,
   c. press up and backwards on the kickstand with the right foot, and
   d. hold cycle erect, ready to mount.

VII. Mounting and Sitting Drills (to be practiced both on and off the stands)

A. **Mounting practice**

1. Stand on the left side and grip both handle bars.
2. Lean the motorcycle towards you at a slight angle.
3. Throw the right leg over the saddle.
4. Assume a squatting (half-stand, half sitting) position.

B. **Dismounting practice** — swing back to the left side holding both grips.

C. **Sitting and posture** — a proper riding position is essential to controlling the motorcycle (to be practiced on the stand).

1. Eyes should be looking up and ahead.
2. Shoulders should be level, loose, and related.
3. Elbows should be turned slightly inward.
4. Hands should be gripping handle bars, knuckles up, and a finger's width from the ends.
5. Wrists should form an angle of 120° degrees from the handle bar grips.
6. Hips should be positioned in such a manner as not to cause a strain upon either the shoulders or the arms.
7. Knees should be pressed firmly against the gas tank.
8. Feet should be positioned so that toes are pointed straight ahead, not out, insteps on the pegs.

UNIT B
THE FIRST RIDE

I. Introduction

A. Purpose

The reason for this lesson is to get under way for the first solo ride. This solo ride will be similar to riding a bicycle. It will concentrate on body balance, position, and confidence while riding the motorcycle.

B. Objectives

1. Balancing the cycle while in motion
2. Moving while keeping your eyes and head up
3. Turning the motorcycle while walking beside it
4. Moving the motorcycle forward in low gear
5. Moving with balance, control, and in a forward path
6. Controlling of the clutch
7. Using the throttle, clutch, and brake in coordination
8. Using the rear brake at 10 m.p.h.

II. Rules to Remember

A. Obey instructor and if you do not understand; speak up immediately.

B. Do not practice without instructor.

C. Do not fix cycle without instructor.

D. Leave a margin of error when riding with class members.

E. In an emergency, warn class members and call instructor.

III. Walking the Motorcycle Without the Engine

Straddle the motorcycle without the engine. In this position you will get the feel of the cycle without the use of the controls. With a buddy system, and using a flat area, one student may push the other. You will want to use the correct procedure — head up, body control, feel of the handle bars, and the use of the rear brake.

IV. Using the Engine of the Motorcycle

A. Riding under motor power

1. Mount the motorcycle.
2. Start engine.
3. While in neutral, coordinate the clutch and brake.
4. Shift to first gear and release to friction point; lift feet to pegs (you will want to practice the friction point several times).
5. Head up and strive for balance and brakeclutch coordination.

B. Coordination of friction point

1. The point at which the motorcycle releases is the friction point. This is the key to a smooth start.
2. When you ease out on clutch and feel the slowing down of the engine, you should ease the throttle up and get under way.
3. You should be able to get this friction point without watching the clutch or throttle.

C. Stalling out

1. All riders stall out; just shift back to neutral and start engine and find friction point.
2. If you feel a stall-out coming, disengage the clutch and then you will coast, like riding a bike.

V. Use of the Back Brake

A. Stopping should be smooth with control action. Do not use the front brake; concentrate only on smooth stopping with the rear brake.

B. Remember that the clutch should be disengaged before braking to prevent stalling.

UNIT C
BASIC MOTORCYCLE DRIVING SKILLS

Objective — This section will develop skills in turning, shifting gears, controlling speed, braking to slow down, and stopping from high speeds.

I. Turning the Motorcycle

A. Always keep knees close to gas tank.

B. Lean in the direction of the turn. — When turning a motor-driven cycle, lean in the direction of the turn rather than turning the handlebars.

C. Exercises for practicing turns.

1. **Weave** — Cones are set up in a straight line; the student weaves through the cones using first gear. As the student masters these maneuvers, the cones will be placed closer together.
2. **Circles** — The student will maneuver the cycle through various size circles at various speeds. The circles will be maneuvered in left and right directions. In this exercise the student may find it necessary to use the rear brake.
3. **Figure "Eight"** — This is a combination of both left and right turns. This will allow the student to practice both left and right turns at the same time.

D. Rules for making turns

1. Lean in direction of the turn.
2. Keep knees close to the gas tank.
3. If braking is needed in the turns, brake lightly using the rear brake.
4. Keep feet on the foot pegs throughout the turns.

II. Changing Gears

A. Most cycles have either four or five forward gears. (There are gears for low, medium, and high speeds.)

B. To change or shift gears you must combine the actions of the clutch, throttle, and gear shift lever.

C. To start the cycle smoothly, first gear must be used. After the cycle is moving, shift from first to second, second to third, third to fourth, until you have reached high gear.

D. To shift from a lower gear to a higher gear, disengage the clutch, close the throttle, and lift the gear shift lever with your toe and allow it to return to the neutral position. This will place the transmission into the next higher gear. After this has been completed, let the clutch out gradually and open the throttle.

E. The procedure for down-shifting is the same as for up-shifting. Disengage the clutch, close the throttle, push down on the gear shift lever, release the gear shift lever, engage the clutch and open the throttle.

Situations for downshifting

1. Going up a hill
2. Turning
3. Stopping

F. Exercises for shifting gears will be done in a straight line.

III. High-Speed Turns

A. Follow the general rules for turning.

1. Slow down before you get to the turn.
2. Downshift.
3. Accelerate after entering the turn.

B. At high speeds your body must lean at the same angle as that of the cycle.

C. Mistakes that affect your turns

1. May not be leaning enough. (If this happens you may run off the outside of the curve.)
2. Leaning too much may cause running off the curve on the inside.

IV. Front and Rear Wheel Braking

A. Seventy percent of the braking power of a motorcycle is in the front wheel.

B. Sequence for using both front and rear brakes

1. Shut off the throttle.
2. Apply rear brake.
3. After the rear brake is applied, gradually

apply the front brake.

4. Downshift as necessary when making your stop.
5. Keep throttle closed.

C. Times when front wheel braking should be used cautiously.

1. When front wheel is turned
2. When motorcycle is leaned in a turn
3. When the road is wet, sandy, or has loose gravel
4. Always apply the brakes gradually to avoid skid.

UNIT D
ROUTINE RIDING SITUATIONS

Purpose — To develop skills necessary for controlling a motorcycle in routine situations.

Objective — The student will learn to

1. *Properly use signals and lights*
2. *Ride at highway speeds*
3. *Stand on the footpegs*
4. *Ride on uneven surfaces and encounter roadway obstacles*
5. *Carry a passenger or other load*

I. Introduction

A. Every road must be considered as a potential obstacle course.

B. Use the **Smith System**

1. Keep the head up and your eyes moving.
2. Anticipate and prepare for hazards ahead of time.
3. Make sure that you are seen.

C. Plan far enough ahead that you may drive around obstacles.

D. Develop the habit of applying and releasing the rear brake when an obstacle is anticipated. Approach obstacles slowly.

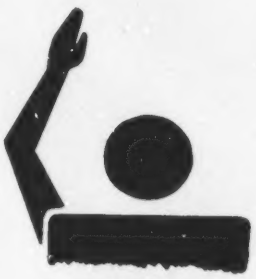
E. Brake before reaching a rough or slippery obstacle.

II. Using Signals and Lights

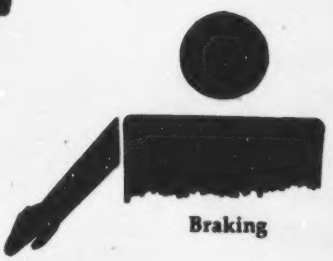
Signals and lights are devices used to communicate your intentions to other drivers and pedestrians. Motorcyclists are required by law to give the same signals that an automobile driver gives.

A. Motorcycling signals include — **Hand Signals** — Although at the loss of some steering control, hand signals must be given on motorcycles that are not equipped with electrical turn signals. Of course, they are recommended even on cycles so equipped because they provide even greater awareness of the cyclist's intentions. These signals are given with the *left hand and arm only.* Practice and master these signals on the range before driving in traffic. Remember that hand signals are difficult to be seen, particularly in rain or fog or at night. The signal should be given early and the hand returned to the hand grip as the turn or stop is made. Before making turns or stops, check in the rearview mirrors and over the shoulder to see that traffic will permit such a maneuver.

Left Turn



Right Turn



Braking

Stop

B. **Electric Turn Signals**

1. The control for these signals is located on the left handlebar and is operated mechanically. This switch activates flashing lights on either side of the cycle.
2. After the turn is completed, the control must be returned to the central position cancelling the signal.
3. Inexperienced cyclists concentrating on maneuvers may forget to cancel the signal. This creates confusion on the part of surrounding motorists and pedestrians and creates an unnecessary potential hazard.
4. Practice giving the electric and hand signals in conjunction with turns and stops on the range before driving in traffic.

C. **Headlight and Taillight**

1. The cyclist must drive as though he is invisible. Driving with headlight and taillight on at all times — day and night — will help to assure maximum visibility.
2. Keep the headlight in the "low beam" position during the day time or when meeting oncoming traffic at night.

D. **Brake Light**

1. On most late-model cycles either the front or rear brake lever will activate the brake light.
2. The brake light can be used as a signal that the cyclist is slowing. The brake light should be flashed by pumping the *rear brake pedal.*
3. "Riding the brake" causes the light to stay on, defeating its purpose as a warning device. This also causes rapid wear of the brake linings.

III. Riding at Highway Speeds

A. Speeds attained in this phase will depend upon the size and layout of the driving area available.

B. The same principles apply to driving at higher speeds that apply to low-speed driving, but certain precautions should be observed due to the increased speed.

1. Turning and braking must be performed gradually to avoid loss of control.
2. More time must be allowed to avoid obstacles. Aim should vary from one-half city block to one-half mile, depending upon speed and conditions.
3. Avoid quick stops from higher speeds. Plan stops well in advance.
4. The *rear brake* must be applied *first* to prevent loss of control.
5. To prevent sudden movements and loss of control, acceleration should be smooth and gradual.
6. Upshift only within the prescribed rpm range. The owner's manual for the individual cycle provides this varying information. The cyclist should learn to shift by "feeling" the speed and by listening to the sound of the engine.

C. **Speeds** — All driving must be accomplished within safe driving speeds. This is a speed from which the cycle can be stopped safely under any condition.

D. **Fast Stops** — Some situations may require the cyclist to stop quickly. This is not an all-out emergency stop. Fast stops are accomplished by

1. Sitting square upon the seat
2. Applying the rear brake, using a steady pressure
3. Applying the front brake
4. Closing the throttle

IV. Standing on the Footpegs

Standing on the footpegs must be demonstrated by the instructor before learning cyclist attempts the maneuver. This is done to prevent shock to the body while riding over rough surfaces.

A. Maintain a firm grip on the handlebars.

B. Lift the body from the seat by pushing upward with the legs.

C. Keep the knees bent slightly and the lower legs perpendicular to the pegs.

D. Keep the wrists and arms flexible to cushion the shock. Uneven or "jerking" acceleration can result from hitting bumps. Keeping the wrists and arms loose will minimize the effects.

E. Return to the seat and normal driving position as soon as possible. Standing on the footpegs is only a temporary measure.

V. Riding on Uneven Surfaces and Encountering Roadway Obstacles

The motorcycle is less stable on uneven surface than the automobile because balance is required to keep the machine upright. Loss of traction can cause a nasty spill on a motorcycle, whereas an automobile might only slide from side to side.

A. Some potential obstacles are

1. **Sand, mud, and water**
   a. More power than normal will be required to ride through these materials.
   b. Difficulty in balance and steering will be encountered.
   c. Starting and stopping will be difficult.
   d. These materials, entering the working

parts of the motorcycle, can cause damage or excessive wear.

2. **Loose gravel**
   a. Falls in loose gravel tend to occur quickly. The effect is that of riding on marbles.
   b. Stopping distances are greatly increased in loose materials.
   c. The cycle and driver can be severely damaged in falls on loose materials ("gravel rash" is a term for abrasions incurred from falling from a cycle).
3. **Bumps and cracks in the road surface**
   a. These obstacles should be observed in advance and driven around.
   b. When these obstacles must be travelled over
      1) Slow down before reaching them
      2) Attempt to cross at a 90° angle
      3) Do not swerve or leave the traffic lane to cross

VI. Every Roadway Must Be Considered a Potential Obstacle

A. Avoid riding on hazardous surfaces until a level of proficiency is attained.

B. General rules for driving on hazardous surfaces are
   1. decelerate and downshift *before* reaching an obstacle,
   2. when traveling over rough surfaces, ride at reduced speeds,
   3. avoid abrupt direction changes,
   4. be ready at all times to maintain balance,
   5. shift weight from wheel that is encountering an obstacle,
   6. check traffic before changing lanes; signal when possible, and
   7. accelerate only after passing the obstacle.

VII. Other Hazards to Consider

A. Accumulated oil and dirt make paved roads most slippery at the start of a rain.

B. Painted roadway markings become slippery when wet.

C. Manhole covers are slippery and become more so when wet.

D. Oil slicks become even more slippery when wet.

E. The front wheel will tend to follow *ruts* in the roadway, causing loss of control.

F. Road litter such as leaves and paper can be very slick, especially when wet.

G. Glass and debris from highway accidents can cause damage to the tires.

VIII. Carrying a Passenger

A. Beginning drivers should not carry passengers since the balance and control problems are multiple. Problems are compounded when the passenger has had no experience riding on a cycle.

B. Procedures and techniques
   1. Start engine before passenger mounts.
   2. Passenger must hold onto waist or hips of driver or onto a passenger handhold.
   3. The passenger's feet must be kept on the passenger footpegs at all times.
   4. Passenger must lean *with* the driver in turns.
   5. Brakes must be applied sooner when stopping.

C. Precautions that the driver must see are strictly observed
   1. Passenger must wear helmet and eye protection.
   2. Passenger may be ridden only on cycles equipped with a proper seat and footpegs for two persons.
   3. Passengers must not lean unless the driver does.
   4. Loose pants legs, shoe laces, etc., can become entangled in the chain.
   5. The passenger must not ride side-saddle.

IX. Carrying Other Loads

A. All loads must be fastened securely to a luggage rack or suitable fixture on the cycle.

B. Packages should be secured to the rear of the cycle to prevent obstruction of vision.

C. Cycle should not be overloaded. Additional weight affects handling characteristics.

D. Security of the load should be checked periodically.

E. Brake and taillights should not be obscured by the load.

UNIT E
RANGE EXERCISES

I. Session I

Exercise, straight line 100 ft.

II. Session II

Repeat exercise, straight line 100 ft.
Circle exercise (see exercise 1)
Serpentine exercise (see exercise 2)

III. Session III

Funnel-T exercise (see exercise 3)
Figure 8 exercise (see exercise 4)

IV. Session IV

Tight serpentine exercise (see exercise 5)
Emergency stop exercise (see exercise 6)

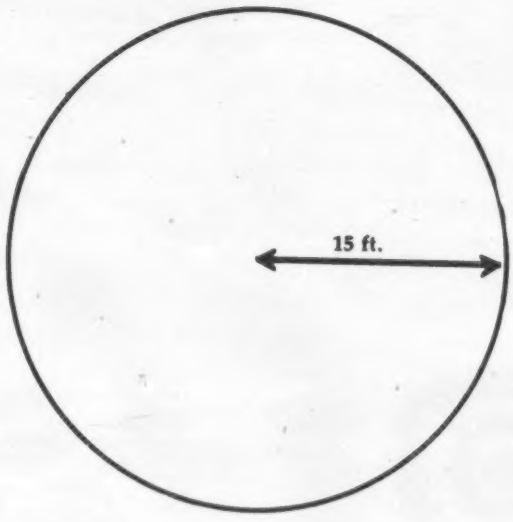
V. Session V

Serpentine exercise (see exercise 2)
Tight serpentine exercise (see exercise 5)
Emergency stop exercise (see exercise 6)
Braking exercise on line (see exercise 7)
Teeterboard exercise (see exercise 8)
Balance beam exercise (see exercise 9)
Serpentine in the dirt (see exercise 10)
Figure 8 in the dirt (see exercise 11)
Riding on the line (see exercise 12)
Log cross-over (see exercise 13)

VI. Session VI

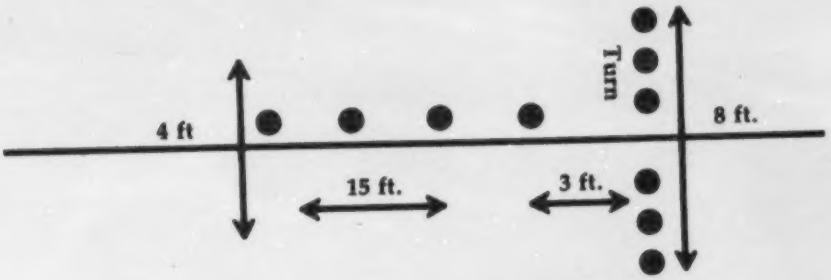
Repeat teeterboard (see exercise 8)
Repeat balance beam (see exercise 9)
Off road — serpentine in dirt (see exercise 10)
figure 8 in dirt (see exercise 11)
circle in dirt (see exercise 1)
line riding (see exercise 12)

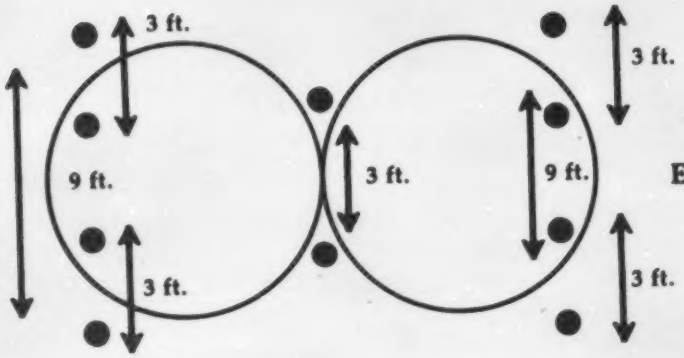
Exercise 1 — Circle



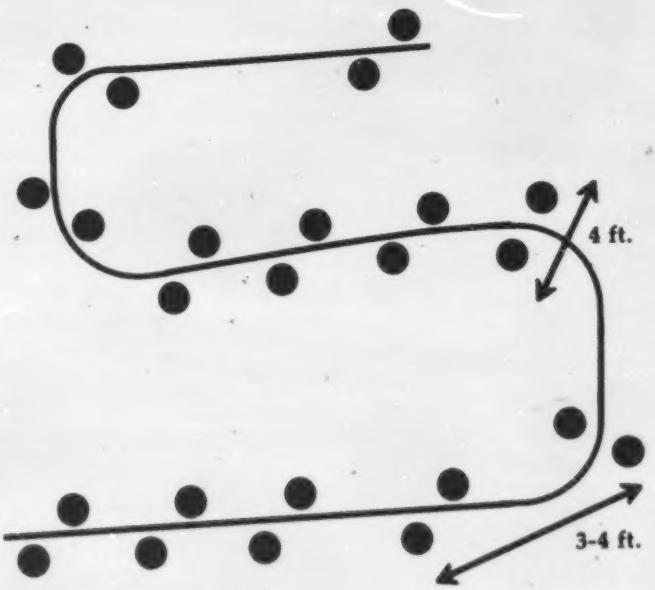
Exercise 2 — Serpentine

Exercise 3 — Funnel-T

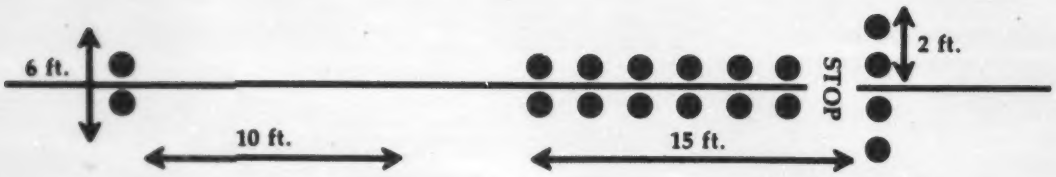




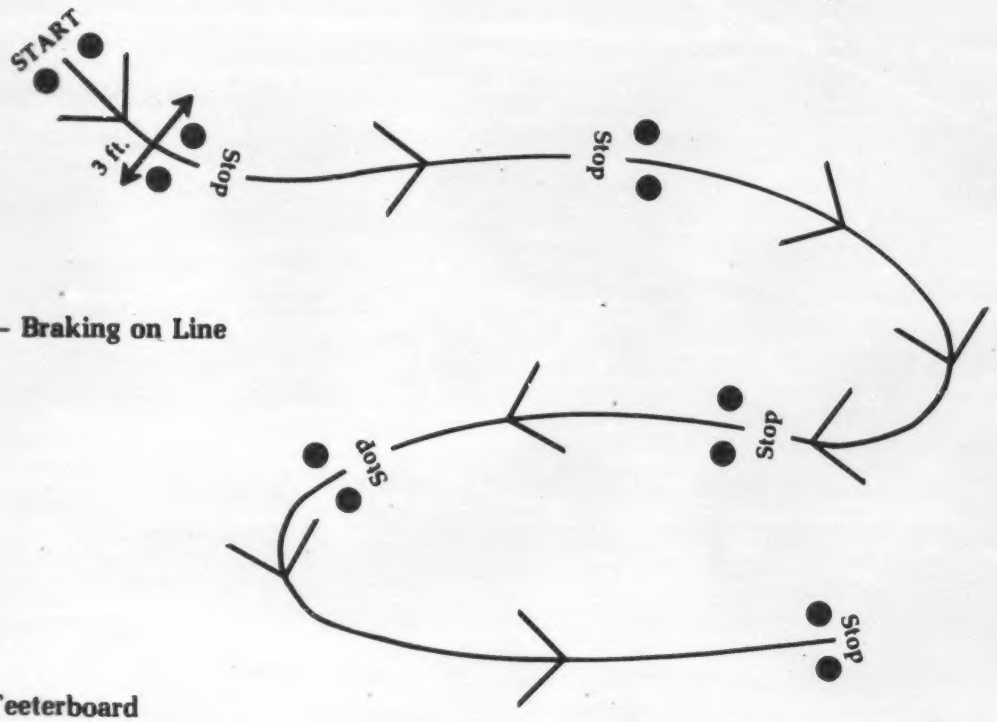
Exercise 4 — Figure 8



Exercise 5 — Tight Serpentine

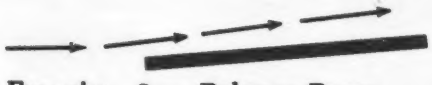


Exercise 6 — Emergency Stop



Exercise 7 — Braking on Line

Exercise 8 — Teeterboard



Exercise 9 — Balance Beam

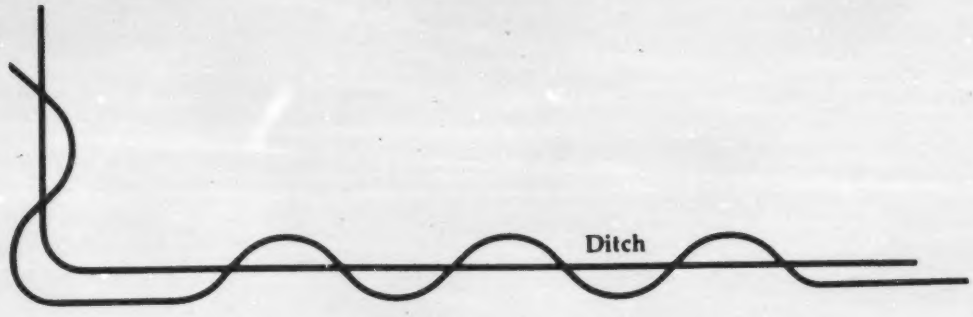
Tight Serpentine

Exercise 10 — Serpentine in the Dirt

Exercise 11 — Figure 8 in the Dirt

Refer to Exercise 4 — Figure 8

Exercise 12 — Riding on the Line



Exercise 13 — Log Cross-Over